6. Please rank the following threats to the wildlife in Dunes and Shorelines Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
High sensitivity to pollution	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Bioaccumulation of contaminants	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Predators (native or domesticated)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**11**

7. Please also rank these threats to the Wildlife in Dunes and Shorelines Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

8. Other threats to the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Dunes and Shorelines Habitat in Indiana identified above.

1. Human disturbance.
Modification/degradation of habitats.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Dunes and Shorelines Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Invasive/non-native species	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat fragmentation	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Successional change	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat degradation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Stream channelization	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Impoundment of water/flow regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Agricultural/forestry practices	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Residual contamination (persistent toxins)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Point source pollution (continuing)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Mining/acidification	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**16**

11. Other HABITAT threats to the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Dunes and Shorelines Habitat in Indiana identified above.

1. Factors that affect food availability
Modification of stream shoreline habitats.

Total Respondents	**1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
	Total Respondents		**8**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not			

regularly scheduled) monitoring conducted by other organizations	
Total Respondents	**8**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**8**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**8**

17. Regional or local state agency monitoring for the Wildlife in Dunes and Shorelines Habitat in Indiana.

1. Breeding Bird Atlas statewide every 20 years

Total Respondents **1**

18. Regional or local monitoring by other organizations for the Wildlife in Dunes and Shorelines Habitat in Indiana.

1. federal Breeding Bird Survey, state May Day counts, Summer Bird Counts

Total Respondents **1**

19. Please list organizations that are monitoring the Wildlife in Dunes and Shorelines Habitat in Indiana.

1. USGS (Breeding Bird Survey) and volunteers with Indiana Audubon Society

Total Respondents **1**

20. What are the current monitoring techniques for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Coverboard routes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Spot mapping	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Driving a survey route	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Mark and recapture	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Professional survey/census	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Volunteer survey/census	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Trapping (by any technique)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Representative sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**12**

21. Other monitoring techniques for the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

1.	Directed surveys (canoe surveys, migration counts) most intensive. General breeding bird surveys less intensive	
	Total Respondents	**1**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
	Total Respondents		**8**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**

Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
		Total Respondents	**8**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

	These efforts are very crucial for this HABITAT	**These efforts are somewhat crucial for this HABITAT**	**These efforts are slightly crucial for this HABITAT**	**These efforts are not crucial for this HABITAT**	**Unknown**	**Response Total**
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
				Total Respondents		**8**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
				Total Respondents		**8**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Dunes and Shorelines Habitat in Indiana.

1. unknown

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Dunes and Shorelines Habitat in Indiana.

1. unknown

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Dunes and Shorelines Habitat in Indiana.

1. unknown

Total Respondents 1

30. What are the current HABITAT inventory and/or assessment techniques for Wildlife in Dunes and Shorelines Habitat in Indiana.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Systematic sampling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Voluntary landowner reporting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**

Total Respondents **9**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

1. aerial imagery to identitfy and quantify habitat.

Total Respondents **1**

33. What is the current body of science for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**1**	**100%**
Inadequate	**0**	**0%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
Total Respondents		**1**

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Dunes and Shorelines Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title Atlas of Breeding Birds in Indiana
Author Castrale, J.S., E. Hopkins, C.E. Keller
Date 1998
Publisher IDNR

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Dunes and Shorelines Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	**0**	**0%**
Author	**0**	**0%**
Date	**0**	**0%**
Publisher	**0**	**0%**
Total Respondents		**0**
(skipped this question)		1

36. What is the current HABITAT body of science for the Wildlife in Dunes and Shorelines Habitat in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		0	0%
Inadequate		1	100%
Nonexistent		0	0%
Other (please explain below)		0	0%
	Total Respondents		1

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Dunes and Shorelines Habitat in Indiana, if available. This resource may be used if further detail is needed.

		Response Total	Response Percent
Title	see previous citation	1	100%
Author		0	0%
Date		0	0%
Publisher		0	0%
	Total Respondents		1

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Dunes and Shorelines Habitat in Indiana. This resource may also be used if further detail is needed.

		Response Total	Response Percent
Title		0	0%
Author		0	0%
Date		0	0%
Publisher		0	0%
	Total Respondents		0
	(skipped this question)		1

39. What are the research needs for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Distribution and abundance	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Threats (predators/competition, contamination)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Relationship/dependence on specific habitats	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Population health (genetic and physical)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**6**

40. Other research needs for the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

41. What are the HABITAT research needs for the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Threats (land use change/competition, contamination/global warming)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Relationship/dependence on specific site conditions	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Growth and development of individual components of the habitat	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**5**

42. Other HABITAT research needs for the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

43. How well do the following conservation efforts address the threats to the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Threats reduction	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Native predator control	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Limiting contact with pollutants/contaminants	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Public education to reduce human disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**16**

44. Other current conservation practices for the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

1. Prevention of stream channelization and other (pollution) habitat factors.
Limit disturbance in nesting/migration habitat.

Total Respondents 1

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Dunes and Shorelines Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Habitat protection on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Habitat protection incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Habitat restoration through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Habitat restoration on public lands	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Habitat restoration incentives (financial)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Succession control (fire, mowing)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Corridor development/protection	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Managing water regimes	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Pollution reduction	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Protection of adjacent buffer zone	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Restrict public access and disturbance	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Land use planning	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Technical assistance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Cooperative land management agreements (conservation easements)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0
				Total Respondents		17

47. Other current HABITAT conservation practices for the Wildlife in Dunes and Shorelines Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Dunes and Shorelines Habitat in Indiana?

1. Water regime management for migration habitat.
Protection of nesting habitat along streams.

Total Respondents **1**

49. Do you have any additional comments or information on the Wildlife in Dunes and Shorelines Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

Appendix E-5: Impoundments

6. Please rank the following threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
High sensitivity to pollution	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Bioaccumulation of contaminants	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Predators (native or domesticated)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Species over population	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
					Total Respondents		**33**

7. Please also rank these threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Habitat loss (feeding/foraging areas)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**29**

8. Other threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana identified above.

1. over population

2. (1) habitat loss (feeding areas) - many reservoirs are getting very old and the once abundant standing timber is now diminishing which is reducing cover for white crappie.
(2) dependence on irregular sources - in many reservoirs, shad is the dominant forage base for crappie. If shad are growing extremely fast, crappie can only utilize shad for a short period of time before the shad outgrow the size crapie can consume.

3. 1) competition with invasives, namely gizzard shad
2) water level control regimes at impoundments

Total Respondents **3**

Appendix E-5: Impoundments

10. Please rank the following threats to the HABITAT of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Invasive/non-native species	0% (0)	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Habitat fragmentation	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Successional change	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Habitat degradation	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Climate change	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Stream channelization	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Impoundment of water/flow regulation	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Agricultural/forestry practices	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Residual contamination (persistent toxins)	0% (0)	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Point source pollution (continuing)	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Mining/acidification	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**50**

11. Other HABITAT threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana identified above.

1. (1) regulation of impounded water - extreme water fluctuations in mainly the Army Corps reservoirs can negatively effect crappie populations especially if the water fluctuations occur during spawning
(2) habitat degradation - the natural decomposition of flooded timber and woody debris is lessening the available cover for crappie. Also, siltation covers root wads left in the bottom of an impoundment which eliminates useable crappie cover.

2. habitat loss/degredation due to a variety of circumstances

Total Respondents **2**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by state agencies	67% (2)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	100% (3)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (3)	0% (0)	**3**
		Total Respondents	**24**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Regional or local once a year monitoring conducted by state agencies	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**

monitoring conducted by state agencies

Total Respondents **24**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**

Total Respondents **24**

17. Regional or local state agency monitoring for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

1. Patoka Lake
Hovey Lake
Dogwood Lake
Lake Sullivan
Many other lakes

2. IDNR - Division of Fish and Wildlife

3. many impoundments throughout the state have general fisheries survey conducted on them and crappie are caught during these

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

1. none

2. none known

3. not aware of any

Total Respondents 3

19. Please list organizations that are monitoring the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

1. DNR/DFW

2. none known

3. NA

Total Respondents 3

20. What are the current monitoring techniques for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Modeling	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Spot mapping	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Mark and recapture	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Professional survey/census	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Volunteer survey/census	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Trapping (by any technique)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Representative sites	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Probabilistic sites	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**30**

21. Other monitoring techniques for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

1. Electrofishing surveys
Trap netting surveys
Gill netting surveys
Angler creel surveys
Population estimates

2. (1) Reporting from harvest(angler creel surveys) - This survey will show angler exploitation.
(2) Professional survey (fish management surveys) - This survey will show size structure, relative abundance, and provide age and growth information.

Total Respondents **2**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
		Total Respondents	**24**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
				Total Respondents		**24**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
					Total Respondents	**24**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

1. None

2. None known to occur.

3. not familiar with habitat assessments that occur on impoundments

Total Respondents **3**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

1. None

2. none known

Total Respondents 2

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

1. None

2. none known

Total Respondents 2

30. What are the current monitoring techniques for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

If a technique is not applicable to the Wildlife in Aquatic Systems Impoundments Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Aerial photography and analysis	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Systematic sampling	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
						Total Respondents	**24**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

none

Total Respondents 1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

Systematic sampling would probably be best to determine the abundance of cover that is available, but could be very difficult as most of the habitat is hidden under the surface of the water.

Total Respondents 1

33. What is the current body of science for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	3	100%
Inadequate	0	0%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents	3	

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title Many in AFS journal of fish management and transactions of AFS
Impoundments Strategic Plan
Author IDNR - Fish and Wildlife
Date 1997
Publisher IDNR - Fish and Wildlife

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0

36. What is the current HABITAT body of science for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	2	67%
Nonexistent	1	33%
Other (please explain below)	0	0%
Total Respondents		3

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana, if available. This resource may be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	**0**	**0%**
Author	**0**	**0%**
Date	**0**	**0%**
Publisher	**0**	**0%**
Total Respondents		**0**

39. What are the research needs for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Distribution and abundance	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Threats (predators/competition, contamination)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Relationship/dependence on specific habitats	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Population health (genetic and physical)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Other (please specify below)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**19**

40. Other research needs for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

How to produce more, larger crappie

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Distribution and abundance (fragmentation)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	**3**
Threats (land use change/competition, contamination/global warming)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Relationship/dependence on specific site conditions	0% (0)	33% (1)	0% (0)	0% (0)	33% (1)	33% (1)	**3**
Growth and development of individual components of the habitat	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**16**

42. Other HABITAT research needs for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

43. How well do the following conservation efforts address the threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Population management (hunting, trapping)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Reintroduction (restoration)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Food plots	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Threats reduction	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Native predator control	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Exotic/invasive species control	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regulation of collecting	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	**3**
Disease/parasite management	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Translocation to new geographic range	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Limiting contact with pollutants/contaminants	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Public education to reduce human disturbance	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Culling/selective removal	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Stocking	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**49**

44. Other current conservation practices for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

1. does not need conserving

2. Habitat protection - Actually, I mean habitat enhancement by adding more woody cover to the old impoundments where the former woody cover has decomposed.

Total Respondents **2**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	3
Habitat protection on public lands	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	3
Habitat protection incentives (financial)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	3
Habitat restoration through regulation	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	3
Habitat restoration on public lands	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	3
Habitat restoration incentives (financial)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	3
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	3
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	3
Succession control (fire, mowing)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	3
Corridor development/protection	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	3
Managing water regimes	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	3
Pollution reduction	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	3
Protection of adjacent buffer zone	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	3
Restrict public access and disturbance	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	3
Land use planning	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	3
Technical assistance	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	3
Cooperative land management agreements (conservation easements)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	3
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
				Total Respondents		52

47. Other current HABITAT conservation practices for the Wildlife in Aquatic Systems Impoundments Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Aquatic Systems Impoundments Habitat in Indiana?

1. (1) Improve land use practices in watershed will reduce sedimentation in impoundments and reduce nutrient inputs. Reducing nutrient inputs will allow a deeper thermocline which is important for crappie growth. Crappie growth suffers when water temperatures become too high.
(2) Habitat restoration in the form of woody debris.

2. in Army Corps of Engineers impoundments alterations in water level control would likely benefit crappie

Total Respondents	**2**

49.	Do you have any additional comments or information on the Wildlife in Aquatic Systems Impoundments Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

no

Total Respondents	**1**

6. Please rank the following threats to the Wildlife in Kettle Lakes Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
High sensitivity to pollution	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Bioaccumulation of contaminants	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Predators (native or domesticated)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
					Total Respondents		**32**

7. Please also rank these threats to the Wildlife in Kettle Lakes Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Habitat loss (feeding/foraging areas)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Large home range requirements	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Viable reproductive population size or availability	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Genetic pollution (hybridization)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
					Total Respondents		**31**

8. Other threats to the Wildlife in Kettle Lakes Habitat in Indiana.

Disturbance by recreational boating.

Total Respondents **1**

9. Please briefly describe the top two threats to the Wildlife in Kettle Lakes Habitat in Indiana identified above.

1. Loss or degradation of nesting habitat. Loss or degradation of brood-rearing and foraging areas.

2. Habitat Loss-Urbanization
Habitat Loss-Breeding,feeding,foraging

3. Habitat loss
Degradation of movement/migration routes

Total Respondents **3**

10. Please rank the following threats to the HABITAT of the Wildlife in Kettle Lakes Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Counterproductive financial incentives or regulations	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Invasive/non-native species	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Habitat fragmentation	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Successional change	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Habitat degradation	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Climate change	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Stream channelization	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Impoundment of water/flow regulation	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	**3**
Agricultural/forestry practices	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Residual contamination (persistent toxins)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Point source pollution (continuing)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Mining/acidification	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Drainage practices (stormwater runoff)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**51**

11. Other HABITAT threats to the Wildlife in Kettle Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Kettle Lakes Habitat in Indiana identified above.

1. Residential development around lake shorelines. Degradation of aquatic plants and wetlands around lake shorelines.

2. Commerical and or residential development
Habitat fragmentation

3. Agricultureal Practices
Urban Development

Total Respondents 3

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Kettle Lakes Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Statewide once a year monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (2)	0% (0)	**2**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (2)	**2**
Regional or local once a year monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (2)	0% (0)	**2**
		Total Respondents	**17**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Kettle Lakes Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Statewide once a year monitoring conducted by other organizations	67% (2)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Regional or local once a year monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	50% (1)	50% (1)	**2**
		Total Respondents	**17**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Statewide once a year monitoring conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local once a year monitoring conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Occasional regional or local (less than						

once a year and not regularly scheduled) monitoring conducted by state agencies	
Total Respondents	**17**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Statewide once a year monitoring conducted by other organizations	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
				Total Respondents		**17**

17. Regional or local state agency monitoring for the Wildlife in Kettle Lakes Habitat in Indiana.

1. Fish and Wildlife properties in northern Indiana

2. Tri-County Fish and Wildlife Area, Division of Fish and Wildlife.

Total Respondents **2**

18. Regional or local monitoring by other organizations for the Wildlife in Kettle Lakes Habitat in Indiana.

1. F&W properties in northern Indiana, natural lakes, nature preserves.

2. Unknown

Total Respondents **2**

Appendix E-6: Kettle Lakes

19. Please list organizations that are monitoring the Wildlife in Kettle Lakes Habitat in Indiana.

1. Audubon Society, Ducks Unlimited, Indiana Division of Fish and Wildlife

2. Unknown

3. BBS

Total Respondents **3**

20. What are the current monitoring techniques for the Wildlife in Kettle Lakes Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Modeling	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Spot mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Driving a survey route	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Mark and recapture	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Professional survey/census	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Volunteer survey/census	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Trapping (by any technique)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Representative sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**28**

21. Other monitoring techniques for the Wildlife in Kettle Lakes Habitat in Indiana.

1. Unknown

2. aerial surveys

Total Respondents **2**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

1. Professional surveys or counts on F&W areas during migration periods (tracts annual migration trends and is index to population levels). Harvest surveys on F&W areas (tracts annual numbers taken) "Wildlife Investigational Techniques" by The Wildlife Society.

2. Mark/Recapture-Banding (intensive), Ducks,Geese&Swans of North America, Frank C. Bellrose
Harvest data collection (less intensive) Wildlife Management Vol 2, Reuben Edwin Trippensee

3. Banding
Brood surveys

Total Respondents **3**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Kettle Lakes Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
		Total Respondents	**24**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Kettle Lakes Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Statewide once a year inventory and assessment conducted by state agencies	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
				Total Respondents		**17**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
				Total Respondents		**24**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Kettle Lakes Habitat in Indiana.

1. Natural lakes in northern Indiana

2. Unknown

Total Respondents **2**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Kettle Lakes Habitat in Indiana.

Unknown

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Kettle Lakes Habitat in Indiana.

1. Indiana Division of Fish and Wildlife

2. Unknown

Total Respondents 2

30. What are the current monitoring techniques for the Wildlife in Kettle Lakes Habitat in Indiana?

If a technique is not applicable to the Wildlife in Kettle Lakes Habitat, do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Aerial photography and analysis	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Systematic sampling	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regulatory information	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Participation in landuse programs	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Modeling	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Voluntary landowner reporting	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**25**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Kettle Lakes Habitat in Indiana.

Unknown

Total Respondents 1

Appendix E-6: Kettle Lakes

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

1. GIS mapping(electronic data base of current habitat) Aerial photography and analysis (examine changes in habitat) "Wildlife Investigational Techniques" by The Wildlife Society.

2. G.I.S. (intensive) Wildlife Management Techniques Manual, Fourth Edition, Sanford D. Schemnitz
Aerial (less intensive) Same

3. Spring counts- aerial

Total Respondents **3**

33. What is the current body of science for the Wildlife in Kettle Lakes Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	1	33%
Inadequate	1	33%
Nonexistent	1	33%
Other (please explain below)	0	0%
Total Respondents		3

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Kettle Lakes Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title Ducks, Geese & Swans of North America
Author Frank C. Bellrose
Date 1976
Publisher Stackpole Books

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Kettle Lakes Habitat in Indiana. This resource may also be used if further detail is needed.

Title Waterfowl & Wetlands an Intergarted review
Author Theodore A. Bookout
Date 1979
Publisher LaCrosse Printing

36. What is the current HABITAT body of science for the Wildlife in Kettle Lakes Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	2	67%
Nonexistent	1	33%
Other (please explain below)	0	0%
Total Respondents		3

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Kettle Lakes Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title Soil Survey's of Indiana Counties
Author U.S. Dept. of Agriculture, SCS
Date 1990
Publisher U.S. Dept. of Agriculture

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Kettle Lakes Habitat in Indiana. This resource may also be used if further detail is needed.

Title Management of Seasonally Flooded Impoundments
Author Leigh H. Fredrickson, T. Scott Taylor
Date 1982
Publisher U.S. Fish and Wildlife Service

39. What are the research needs for the Wildlife in Kettle Lakes Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Distribution and abundance	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	**3**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Threats (predators/competition, contamination)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Relationship/dependence on specific habitats	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Population health (genetic and physical)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**20**

40. Other research needs for the Wildlife in Kettle Lakes Habitat in Indiana.

1. Unknown

2. harvest
survival/nest success

Total Respondents **2**

41. What are the HABITAT research needs for the Wildlife in Kettle Lakes Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Distribution and abundance (fragmentation)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Threats (land use change/competition, contamination/global warming)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Relationship/dependence on specific site conditions	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Growth and development of individual components of the habitat	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**

Total Respondents 17

42. Other HABITAT research needs for the Wildlife in Kettle Lakes Habitat in Indiana.

Unknown

Total Respondents 1

43. How well do the following conservation efforts address the threats to the Wildlife in Kettle Lakes Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	3
Population management (hunting, trapping)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	3
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	3
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	3
Food plots	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	3
Threats reduction	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	3
Native predator control	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	3
Exotic/invasive species control	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	3
Regulation of collecting	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	3
Disease/parasite management	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	3
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	3
Protection of migration routes	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	3
Limiting contact with pollutants/contaminants	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	3
Public education to reduce human disturbance	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	3
Culling/selective removal	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	3
Stocking	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	3
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	2
					Total Respondents	50

44. Other current conservation practices for the Wildlife in Kettle Lakes Habitat in Indiana.

Unknown

Total Respondents 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

1. Habitat protection (without habitat the Mallard won't do well) Population management (makes use of surplus numbers and regulates take) "The Mallard" by John Madson Olin Mathieson Chemical Corporation.

2. Habitat Protection (intensive) Reproduction and Protection, Ducks,Geese & Swans of North America, Bellrose Protection of Migrating Routes (intensive) Same

3. Hen houses
habitat conservation
buffer zones

Total Respondents **3**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Kettle Lakes Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Habitat protection on public lands	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Habitat protection incentives (financial)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Habitat restoration through regulation	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Habitat restoration on public lands	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Habitat restoration incentives (financial)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Artificial habitat creation (artificial reefs, nesting platforms)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Succession control (fire, mowing)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Corridor development/protection	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Managing water regimes	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Pollution reduction	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Protection of adjacent buffer zone	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Restrict public access and disturbance	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Land use planning	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Technical assistance	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Cooperative land management agreements (conservation easements)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
				Total Respondents		**53**

47. Other current HABITAT conservation practices for the Wildlife in Kettle Lakes Habitat in Indiana.

Unknown

Total Respondents **1**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Kettle Lakes Habitat in Indiana?

1. Habitat protection through regulation (only sure way to protect habitat without public ownership) Purchase more public land.

2. Habitat protection through regulation, (less intensive)cover a large geographic area. Ducks,Geese & Swans of North America, Bellrose
Habitat Protection through incentives, (intensive), best landowner cooperation, Same

3. Landowner programs
buffers
habitat conservation regulations

Total Respondents **3**

49. Do you have any additional comments or information on the Wildlife in Kettle Lakes Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

1. No

2. Kettle Lakes are limited in number, although habitat surrounding them can be manipulated. No new Kettle Lakes can be created so it is critical to provide protection through, regulations, incentives and management.

3. Provide information on habitat creation and farming techniques.
Provide incentives to create/maintain such habitat

Total Respondents **3**

6. Please rank the following threats to the Wildlife in Lake Michigan Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
High sensitivity to pollution	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Bioaccumulation of contaminants	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Predators (native or domesticated)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
					Total Respondents		**22**

7. Please also rank these threats to the Wildlife in Lake Michigan Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	50% (1)	5 0% (1)	0% (0)	0% (0)	**2**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Small native range (high endemism)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Viable reproductive population size or availability	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Specialized reproductive behavior or low reproductive rates	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**20**

8. Other threats to the Wildlife in Lake Michigan Habitat in Indiana.

Commercial over exploitation resulting in low spawner stock abundance.

Egg predators predation, nutritional requirements, early mortality syndrome

Total Respondents **2**

9. Please briefly describe the top two threats to the Wildlife in Lake Michigan Habitat in Indiana identified above.

Year class failure related to low spawner stock abundance. Competition with non native wildlife species for limited available food resources.

Lack of successful spawning, possibly related to bioenergetics. Too much egg predation.

Total Respondents **2**

10. Please rank the following threats to the HABITAT of the Wildlife in Lake Michigan Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Invasive/non-native species	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Habitat fragmentation	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Successional change	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Habitat degradation	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Climate change	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Stream channelization	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Agricultural/forestry practices	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Residual contamination (persistent toxins)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Point source pollution (continuing)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**32**

11. Other HABITAT threats to the Wildlife in Lake Michigan Habitat in Indiana.

Competition with round goby for nearshore habitat.

Total Respondents **1**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Lake Michigan Habitat in Indiana identified above.

Competition with non native species for habitat. Need a quality place to live that is not in competiton with round goby.

Identification of habitat along Indiana's nearshore area.

Appendix E-7: Lake Michigan

Total Respondents	**2**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Lake Michigan Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	**0**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	**0**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	**0**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	**0**
Regional or local year-round monitoring conducted by state agencies	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by state agencies	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	**0**
		Total Respondents	**3**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Lake Michigan Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	**0**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	**0**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	**0**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	**0**
Regional or local year-round monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other	0% (0)	0% (0)	**0**

organizations		
	Total Respondents	**3**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Lake Michigan Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by state agencies	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**9**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Lake Michigan Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local once a year monitoring conducted by other organizations	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
				Total Respondents		**9**

17. Regional or local state agency monitoring for the Wildlife in Lake Michigan Habitat in Indiana.

Lake Michigan proper out of Michigan City.

Spring assessment out of Michigan City. Fall spawning assessment, Indiana waters of Lake Michigan. 9 month creel survey for harvest information. These efforts are conducted by the IDNR-Fish and Wildlife division.

Total Respondents **2**

18. Regional or local monitoring by other organizations for the Wildlife in Lake Michigan Habitat in Indiana.

Out of Michgian City and near Gary by Ball State University.

USFWS and Illinois natural history survey egg and fry assessments at the Port of Indiana. THis is part of a Fish and Wildlife Restoration Grant.

Total Respondents **2**

Appendix E-7: Lake Michigan

19. Please list organizations that are monitoring the Wildlife in Lake Michigan Habitat in Indiana.

IDNR-Fish and Wildlife, Ball State University, University of Michigan through a coastal program grant. USFWS

Indiana DNR, Division of Fish and Wildlife. Illinois Natural History Survey, USFWS>

Total Respondents **2**

20. What are the current monitoring techniques for the Wildlife in Lake Michigan Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Modeling	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Spot mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Driving a survey route	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Mark and recapture	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Professional survey/census	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Volunteer survey/census	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Trapping (by any technique)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Representative sites	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**14**

21. Other monitoring techniques for the Wildlife in Lake Michigan Habitat in Indiana.

Long term monitoring through gillnets, trawling has been conducted at 3 sites along the lake michigan lakefront since the mid 70's by Ball State University during the summer season. Creel census has been conducted by IDNR-Fish and Wildlife division for approximately 20 years. Commerical monitoring was conducted until the halt of the commercial fishing industry in 1996.

Total Respondents **1**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Lake Michigan Habitat in Indiana?

Fall trawl sampling for young of the year production. Possible incorporation of hydracoustic models for the near shore area.

I would like to see all the lake trout stocked in Lake Michigan to be coded wire tagged. That will allow for better understanding of survival after stocking and movement of the fish. It will also allow for better understanding of spawning site fidelity.

Total Respondents **2**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Lake Michigan Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	100% (2)	0% (0)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	100% (1)	0% (0)	**1**
		Total Respondents	**9**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Lake Michigan Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	100% (1)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	50% (1)	50% (1)	**2**
		Total Respondents	**9**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Lake Michigan Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**9**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Lake Michigan Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
				Total Respondents		**9**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Lake Michigan Habitat in Indiana.

Lake Michigan proper along the shoreline in nearshore area less than 30 feet in depth.

Habitat mapping and shoreline aerial imagery.

Total Respondents **2**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Lake Michigan Habitat in Indiana.

Lake Michigan proper along the shoreline in nearshore area less than 30 feet in depth.

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Lake Michigan Habitat in Indiana.

IDNR, USFSW, Ball State, University of Michigan

Indiana DNR- Fish and Wildlife division. USFWS/GLFC

Total Respondents 2

30. What are the current monitoring techniques for the Wildlife in Lake Michigan Habitat in Indiana?

If a technique is not applicable to the Wildlife in Lake Michigan Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Aerial photography and analysis	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Systematic sampling	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Property tax estimates	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regulatory information	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Modeling	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**13**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Lake Michigan Habitat in Indiana.

Bottom mapping of habitat.

Total Respondents **1**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Lake Michigan Habitat in Indiana?

Lidar mapping would help identify spawning areas within the nearshore zone along Indiana's coastline.

Digital satellite imagery to conduct bottom contour mapping in nearshore spawning areas.

Total Respondents **2**

33. What is the current body of science for the Wildlife in Lake Michigan Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**1**	**50%**
Inadequate	**1**	**50%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
Total Respondents		2

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Lake Michigan Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Preliminary Results of 2004 Ball State University Yellow Perch Research in Indiana Waters of Lake Michigan;
Author = Paul Allen and Thomas Lauer;
Date = Cctober 2004;
Publisher = Ball State University

Title = Yellow Perch Research and Management in Lake Michgian, Evaluating Progress in a Cooperative Effort, 1997-2001;
Author = David Clapp and John Dettmers;
Date = November 2004;
Publisher = American Fisheries Society, Fisheries

Title = Lake Trout Restoration Plan;
Date = In progress

Title = Lake Trout Impediments Docuement;
Author = Numerous,;
Date = 2003;
Publisher = Lake Trout Task group/LMTC

Appendix E-7: Lake Michigan

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Lake Michigan Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Yellow Perch Research and Management in Lake Michgian, Evaluating Progress in a Cooperative Effort, 1997-2001
Author = David Clapp and John Dettmers
Date = November 2004
Publisher = American Fisheries Society, Fisheries

Title = Lake Trout Impediments Documents
Author = Numerous,
Date = 2003
Publisher = Lake Trout Task group/LMTC

36. What is the current HABITAT body of science for the Wildlife in Lake Michigan Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	2	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		2

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Lake Michigan Habitat in Indiana, if available. This resource may be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0
(skipped this question)		1

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Lake Michigan Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0
(skipped this question)		1

39. What are the research needs for the Wildlife in Lake Michigan Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	2
Distribution and abundance	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	2
Limiting factors (food, shelter, water, breeding sites)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	2
Threats (predators/competition, contamination)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	2
Relationship/dependence on specific habitats	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	2
Population health (genetic and physical)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	2
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0
Total Respondents							12

40. Other research needs for the Wildlife in Lake Michigan Habitat in Indiana.

No responses were entered for this question.

Total Respondents	0
(skipped this question)	1

41. What are the HABITAT research needs for the Wildlife in Lake Michigan Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Threats (land use change/competition, contamination/global warming)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Relationship/dependence on specific site conditions	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Growth and development of individual components of the habitat	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**10**

42. Other HABITAT research needs for the Wildlife in Lake Michigan Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

43. How well do the following conservation efforts address the threats to the Wildlife in Lake Michigan Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Population management (hunting, trapping)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Population enhancement (captive breeding and release)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Reintroduction (restoration)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Food plots	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Threats reduction	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Native predator control	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Exotic/invasive species control	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Regulation of collecting	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Disease/parasite management	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Limiting contact with pollutants/contaminants	0% (0)	50% (1)	50% (0)	0% (0)	0% (0)	**2**
Public education to reduce human disturbance	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Stocking	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		32

44. Other current conservation practices for the Wildlife in Lake Michigan Habitat in Indiana.

Regulation of sport harvest. Closure of commercial fishery to allow spawning stock biomass to increase, thus allowing for the production of offspring that can eventually add to the spawning stock biomass.

Total Respondents 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Lake Michigan Habitat in Indiana?

Completely eliminate commercial fishing. This appears to have reduced the spawning stock to a level that could not maintain a fishery.

Total Respondents 1

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Lake Michigan Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat protection on public lands	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Habitat protection incentives (financial)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Habitat restoration through regulation	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Habitat restoration on public lands	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Habitat restoration incentives (financial)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Corridor development/protection	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Managing water regimes	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Pollution reduction	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Protection of adjacent buffer zone	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Restrict public access and disturbance	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Land use planning	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Technical assistance	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Cooperative land management agreements (conservation easements)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**33**

47. Other current HABITAT conservation practices for the Wildlife in Lake Michigan Habitat in Indiana.

Limiting disturbance through the construction(DOW) permit process.

Total Respondents **1**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Lake Michigan Habitat in Indiana?

Habitat creation, ie. artificial structures during lake construction projects

Total Respondents **1**

49. Do you have any additional comments or information on the Wildlife in Lake Michigan Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

Much research work has been done on the the yellow perch by Ball State University since the mid 1970's. This works serves as the framework for the management of the population in Indiana's waters of Lake Michigan. It is critical that funding for this project continue to maintain the dataset. It is the largest and longest dataset for yellow perch on all of Lake Michigan and has served as the foundation for many management decisions on sport and commerical harvest decisions.

Total Respondents **1**

6. Please rank the following threats to the Wildlife in Natural Lakes Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
High sensitivity to pollution	50% (2)	0% (0)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Bioaccumulation of contaminants	0% (0)	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	**4**
Predators (native or domesticated)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	**4**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	25% (1)	0% (0)	25% (1)	50% (2)	**4**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	**4**
Regulated hunting/fishing pressure (too much)	0% (0)	25% (1)	0% (0)	25% (1)	25% (1)	25% (1)	**4**
Species over population	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	**4**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	25% (1)	0% (0)	0% (0)	50% (2)	0% (0)	25% (1)	**4**
					Total Respondents		**44**

7. Please also rank these threats to the Wildlife in Natural Lakes Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	25% (1)	25% (1)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
Habitat loss (feeding/foraging areas)	50% (2)	0% (0)	25% (1)	25% (1)	0% (0)	0% (0)	**4**
Small native range (high endemism)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	0% (0)	**4**
Near limits of natural geographic range	25% (1)	25% (1)	0% (0)	25% (1)	25% (1)	0% (0)	**4**
Large home range requirements	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Viable reproductive population size or availability	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Specialized reproductive behavior or low reproductive rates	25% (1)	25% (1)	25% (1)	25% (1)	0% (0)	0% (0)	**4**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	75% (3)	0% (0)	0% (0)	25% (1)	**4**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**37**

8. Other threats to the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Natural Lakes Habitat in Indiana identified above.

1. Long-term declines in water quality associated with lake eutrophication.
Annual and seasonal variations in habitat availability.

2. -Cold, clear water is critical for cisco survival; increased runoff and nutrient loading have degraded the habitat for this species in many of the 50+ lakes it once occurred in. Few lakes still have the species, and there is apparently little to no reproduction.
-The deliberate stocking of predator fish in cisco lakes has been a threat to this species for years; if this hasn't been stopped, it needs to.

1. Loss of habitat (reproductive/feeding) that is essential for northern pike survival
Over harvest and illegal harvest (This doesn't seem to be a major threat as of now)

1. Loss of undisturbed natural lake habitat.

Total Respondents	**4**

10. Please rank the following threats to the HABITAT of the Wildlife in Natural Lakes Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Invasive/non-native species	0% (0)	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
Nonpoint source pollution (sedimentation and nutrients)	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	0% (0)	**4**
Habitat fragmentation	0% (0)	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
Successional change	25% (1)	25% (1)	0% (0)	25% (1)	25% (1)	0% (0)	**4**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Habitat degradation	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Climate change	25% (1)	0% (0)	0% (0)	0% (0)	50% (2)	25% (1)	**4**
Stream channelization	0% (0)	0% (0)	75% (3)	25% (1)	0% (0)	0% (0)	**4**
Impoundment of water/flow regulation	0% (0)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Agricultural/forestry practices	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Residual contamination (persistent toxins)	0% (0)	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	**4**
Point source pollution (continuing)	0% (0)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	**4**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Drainage practices (stormwater runoff)	0% (0)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**66**

11. Other HABITAT threats to the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	2

12. Please briefly describe the top two HABITAT threats to the Wildlife in Natural Lakes Habitat in Indiana identified above.

Habitat degradation
Successional change

Water quality degradation that leads to cloudy water is the key threat.

1.Emergent bulrush and wetland habitat loss. It has been well documented in northern states that northern pike prefer flooded vegetation for spawning during the spring. Loss of this habitat from boating and wildlife (waterfowl and muskrat feeding) may reduce reproductive habitat for northern pike in some natural lakes.
2. Bulkhead seawall development reduces emergent vegetation used by northern pike for reproduction and for cover during feeding.

Shoreline and labebed alterations

Total Respondents **4**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Natural Lakes Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (4)	**4**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	25% (1)	75% (3)	**4**
Regional or local year-round monitoring conducted by state agencies	25% (1)	75% (3)	**4**
Regional or local once a year monitoring conducted by state agencies	25% (1)	75% (3)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	50% (2)	50% (2)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (4)	0% (0)	**4**
		Total Respondents	**32**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Natural Lakes Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local once a year monitoring conducted by other organizations	25% (1)	75% (3)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	25% (1)	75% (3)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	25% (1)	75% (3)	**4**
	Total Respondents		**32**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Natural Lakes Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	**4**
Regional or local year-round monitoring conducted by state agencies	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Regional or local once a year monitoring conducted by state agencies	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
				Total Respondents		**32**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Natural Lakes Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Regional or local once a year monitoring conducted by other organizations	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
				Total Respondents		**32**

17. Regional or local state agency monitoring for the Wildlife in Natural Lakes Habitat in Indiana.

1. Division of Fish and Wildlife at cisco lakes
Department of Environmental Management water quality monitoring

2. NE Indiana by DFW (Jed Pearson)

1.Northern Pike are monitored via general fish surveys conducted to update lake status. There is now monitoring of northern pike on a general schedule.
2. There was a tracking study conducted in two Indaia natural lakes in the late 1990's by the IDNR to better understand reproductive habitat of northern pike.

Division of Fish and Wildlife standardized largemouth bass sampling protocols
Tournament fishing monitoring by the Division of Fish and Wildlife

Total Respondents **4**

18. Regional or local monitoring by other organizations for the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

19. Please list organizations that are monitoring the Wildlife in Natural Lakes Habitat in Indiana.

Bass fishing clubs who hold tournaments on Lake Wawasee and Syracuse Lake

Total Respondents 1

20. What are the current monitoring techniques for the Wildlife in Natural Lakes Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	50% (2)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
Modeling	0% (0)	25% (1)	25% (1)	0% (0)	0% (0)	50% (2)	**4**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Spot mapping	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Mark and recapture	25% (1)	0% (0)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
Professional survey/census	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	25% (1)	**4**
Volunteer survey/census	0% (0)	25% (1)	50% (2)	0% (0)	0% (0)	25% (1)	**4**
Trapping (by any technique)	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Representative sites	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**40**

21. Other monitoring techniques for the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Natural Lakes Habitat in Indiana?

Occasional gill-netting to verify presence followed by intensive netting to confirm low levels or absence.

Large fyke-nets are used in Lake Webster (Kosicusko Co.) to collected brood stock for muskellunge. These nets would be useful in capturing northern pike as well. This would allow bioligist to capture enough fish to get a represetative sample of adult fish. There is still no effective method of sampling young esocids without mortality.

Springtime dc electrofishing according to DFW standard protocol
Standard DFW creel survey procedures
Tournament monitoing by the DFW and bass clubs

Total Respondents	**3**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Natural Lakes Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	50% (2)	50% (2)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	75% (3)	25% (1)	**4**
	Total Respondents		**32**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Natural Lakes Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	50% (2)	50% (2)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	50% (2)	50% (2)	**4**
		Total Respondents	**32**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Natural Lakes Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	25% (1)	0% (0)	25% (1)	50% (2)	**4**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	50% (2)	0% (0)	0% (0)	50% (2)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	50% (2)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
				Total Respondents		**32**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Natural Lakes Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	**4**
				Total Respondents		**32**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Natural Lakes Habitat in Indiana.

NE IN, DFW, Jed Pearson.

Recently the IDNR has began sampling/mapping emergent plant species in some Indiana natural lakes. These plants may be used as reproductive habiatat for northern pike.

Not aware of any

Total Respondents **3**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Natural Lakes Habitat in Indiana.

Not aware of any

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Natural Lakes Habitat in Indiana.

Not aware of any

Total Respondents 1

30. What are the current monitoring techniques for the Wildlife in Natural Lakes Habitat in Indiana.

If a technique is not applicable to the Wildlife in Natural Lakes Habitat, do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	25% (1)	25% (1)	0% (0)	0% (0)	50% (2)	**4**
Aerial photography and analysis	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Systematic sampling	0% (0)	25% (1)	25% (1)	0% (0)	0% (0)	50% (2)	**4**
Property tax estimates	0% (0)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
State revenue data	0% (0)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Regulatory information	0% (0)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Participation in landuse programs	0% (0)	25% (1)	0% (0)	0% (0)	25% (1)	50% (2)	**4**
Modeling	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Voluntary landowner reporting	0% (0)	25% (1)	25% (1)	0% (0)	0% (0)	50% (2)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**36**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Natural Lakes Habitat in Indiana?

1.Emergent bulrush and wetland monitoring and protection via ecozones
2. Evaluate land and water use practices to reduce in lake and upstream degradation of vegetation and shoreline.

Unknown

Total Respondents **2**

33. What is the current body of science for the Wildlife in Natural Lakes Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**1**	**25%**
Inadequate	**3**	**75%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
Total Respondents		4

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Natural Lakes Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Cisco population status and management in Indiana
Author = Jed Pearson
Date = 2001
Publisher = Division of Fish and Wildlife

Title = Northern Pike Spawning Habitat Investigations At Two Narural Lake In Indiana
Author = Cwalinski, Tim A.
Date = September 2001
Publisher = Indiana Department of Natural Resources

Title = DFW largemouth bass database
Author = Jed Pearson
Date = unpublished
Publisher = unpublished

	Response Total	Response Percent

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Natural Lakes Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Largemouth bass size limits at Indiana natural lakes - a 30-year history
Author = Jed Pearson
Date = 2003
Publisher = unpublished

	Response Total	Response Percent

36. What is the current HABITAT body of science for the Wildlife in Natural Lakes Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	3	75%
Nonexistent	1	25%
Other (please explain below)	0	0%
Total Respondents		4

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Natural Lakes Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Cisco population status and management in Indiana
Author = Jed Pearson
Date = 2001
Publisher = Division of Fish and Wildlife

	Response Total	Response Percent

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Natural Lakes Habitat in Indiana. This resource may also be used if further detail is needed.

Appendix E-8: Natural Lakes

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0

39. What are the research needs for the Wildlife in Natural Lakes Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	100% (4)	0% (0)	0% (0)	0% (0)	4
Distribution and abundance	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	4
Limiting factors (food, shelter, water, breeding sites)	0% (0)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	4
Threats (predators/competition, contamination)	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	4
Relationship/dependence on specific habitats	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	4
Population health (genetic and physical)	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	4
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
					Total Respondents		25

40. Other research needs for the Wildlife in Natural Lakes Habitat in Indiana.

Limiting factors and impacts of competition and predation

Total Respondents 1

41. What are the HABITAT research needs for the Wildlife in Natural Lakes Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	0% (0)	**4**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	**4**
Threats (land use change/competition, contamination/global warming)	0% (0)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Relationship/dependence on specific site conditions	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	**4**
Growth and development of individual components of the habitat	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
					Total Respondents		**21**

42. Other HABITAT research needs for the Wildlife in Natural Lakes Habitat in Indiana.

Water quality variations and impacts of land us and shoreline alterations

Total Respondents 1

43. How well do the following conservation efforts address the threats to the Wildlife in Natural Lakes Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Population management (hunting, trapping)	50% (2)	0% (0)	0% (0)	50% (2)	0% (0)	**4**
Population enhancement (captive breeding and release)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Reintroduction (restoration)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Food plots	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Threats reduction	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Native predator control	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Exotic/invasive species control	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Regulation of collecting	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Disease/parasite management	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Translocation to new geographic range	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Protection of migration routes	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Limiting contact with pollutants/contaminants	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Public education to reduce human disturbance	25% (1)	25% (1)	0% (0)	50% (2)	0% (0)	**4**
Culling/selective removal	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Stocking	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
				Total Respondents		**66**

44. Other current conservation practices for the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Natural Lakes Habitat in Indiana?

1. Habitat protection and education to reduce habitat disturbance

2. -Assure there is no stocking of predator fish in cisco lakes
-Greatly limit/mitigate any new development on cisco lakes, particularly addressing runoff from lawns and other water quality issues
-Work to get any farmlands adjacent to cisco lakes into no-till

1.Implementation of ecozones in undeveloped areas to conserve that vegetation present.
2. Implement a catch and release only regulation in lakes with low densities.

Habitat management and harvest management

Total Respondents **4**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Natural Lakes Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Habitat protection on public lands	0% (0)	75% (3)	0% (0)	0% (0)	25% (1)	**4**
Habitat protection incentives (financial)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	**4**
Habitat restoration through regulation	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
Habitat restoration on public lands	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Habitat restoration incentives (financial)	0% (0)	50% (2)	0% (0)	25% (1)	25% (1)	**4**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Succession control (fire, mowing)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Corridor development/protection	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Managing water regimes	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Pollution reduction	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Protection of adjacent buffer zone	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Restrict public access and disturbance	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Land use planning	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Technical assistance	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Cooperative land management agreements (conservation easements)	25% (1)	25% (1)	0% (0)	25% (1)	25% (1)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**69**

47. Other current HABITAT conservation practices for the Wildlife in Natural Lakes Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 2

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Natural Lakes Habitat in Indiana?

Pollution reduction and land-use zoning

1.Implementation of ecozones in undeveloped areas to conserve that vegetation present.
2. Reduce inlet and upstream degradation. Increase awareness and cooperation of landowners to create better shoreline and tributary habitat.

Habitat protection and restoration through regulation.

Total Respondents **3**

49. Do you have any additional comments or information on the Wildlife in Natural Lakes Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No responses were entered for this question.

Total Respondents **0**

6. Please rank the following threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
High sensitivity to pollution	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Bioaccumulation of contaminants	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Predators (native or domesticated)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
					Total Respondents		**22**

7. Please also rank these threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Habitat loss (feeding/foraging areas)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Small native range (high endemism)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Near limits of natural geographic range	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**19**

8. Other threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

Stream channelizing

Total Respondents **1**

9. Please briefly describe the top two threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana identified above.

Habitat loss & habitat degradation

sediment deposition

Total Respondents **2**

10. Please rank the following threats to the HABITAT of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Invasive/non-native species	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Nonpoint source pollution (sedimentation and nutrients)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Habitat fragmentation	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Successional change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Habitat degradation	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Stream channelization	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Impoundment of water/flow regulation	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Agricultural/forestry practices	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Mining/acidification	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Drainage practices (stormwater runoff)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**35**

11. Other HABITAT threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana identified above.

1. Habitat loss & degradation

Total Respondents	**1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (2)	**2**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (2)	**2**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (2)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	50% (1)	50% (1)	**2**
		Total Respondents	**14**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Regional or local year-round monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Regional or local once a year monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	50% (1)	50% (1)	**2**

Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	50% (1)	50% (1)	**2**
		Total Respondents	**16**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
				Total Respondents		**16**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local year-round monitoring conducted by other organizations	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Regional or local once a year monitoring conducted by other organizations	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
				Total Respondents		**16**

17. Regional or local state agency monitoring for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

None

Patoka River watershed

Total Respondents **2**

18. Regional or local monitoring by other organizations for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

Newton, Jasper, Pulaski, Starke, Lake & Porter Counties

Total Respondents **1**

19. Please list organizations that are monitoring the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

Robert Brodman, Saint Joseph's College

DNR/DFW

Total Respondents **2**

20. What are the current monitoring techniques for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Modeling	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Coverboard routes	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Spot mapping	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Driving a survey route	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	**2**
Mark and recapture	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Professional survey/census	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Volunteer survey/census	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Trapping (by any technique)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Representative sites	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Probabilistic sites	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**24**

21. Other monitoring techniques for the Wildlife in Lake Michigan Habitat in Indiana.

No responses entered for this question.

Total Respondents **0**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

Minnow trapping and either mark recapture or telemetry

Electrofishing
Trap nets

Total Respondents 2

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
		Total Respondents	**16**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Regional or local year-round inventory and assessment conducted by other organizations	50% (1)	50% (1)	**2**
Regional or local once a year inventory and assessment conducted by other organizations	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	50% (1)	50% (1)	**2**
	Total Respondents		**16**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
				Total Respondents		**16**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regional or local year-round inventory and assessment conducted by other organizations	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
				Total Respondents		**16**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

None.

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

1. Newton, Jasper, Starke, Pulaski, Lake & Porter counties

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

Robert Brodman, Saint Joseph's College

None that I am aware of

Total Respondents 2

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	2
Aerial photography and analysis	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	2
Systematic sampling	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	2
Property tax estimates	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	2
State revenue data	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	2
Regulatory information	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	2
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	2
Modeling	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	2
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	2
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
						Total Respondents	19

31. Other HABITAT inventory and assessment techniques for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

1. suvery (intensive) and GIS (less intenstive)

Total Respondents **1**

33. What is the current body of science for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	2	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		2

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Amphibians and reptiles from 23 counties of Indiana.
Author = Robert Brodman
Date = 2003
Publisher = Proceedings of the Indiana Academy of Science, 112: 43-54.

	Response Total	Response Percent

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0

36. What is the current HABITAT body of science for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	1	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		1

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Amphibians and reptiles from 23 counties of Indiana.
Author = Robert Brodman
Date = 2003
Publisher = Proceedings of the Indiana Academy of Science, 112: 43-54

Response Total	Response Percent

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0

39. What are the research needs for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	2
Distribution and abundance	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	2
Limiting factors (food, shelter, water, breeding sites)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	2
Threats (predators/competition, contamination)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	2
Relationship/dependence on specific habitats	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	2
Population health (genetic and physical)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	2
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0
					Total Respondents		12

40. Other research needs for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

1.	Very little is known about the basic natural history, population ecology and abundance in Indiana of the lesser siren.	
	Total Respondents	1

41. What are the HABITAT research needs for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Distribution and abundance (fragmentation)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Threats (land use change/competition, contamination/global warming)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Relationship/dependence on specific site conditions	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Growth and development of individual components of the habitat	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**11**

42. Other HABITAT research needs for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

1. Factors that limit the distribution of sirens in Indiana

Total Respondents **1**

43. How well do the following conservation efforts address the threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Food plots	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Threats reduction	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Native predator control	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regulation of collecting	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Disease/parasite management	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Protection of migration routes	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Public education to reduce human disturbance	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Culling/selective removal	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Stocking	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**33**

44. Other current conservation practices for theWildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

1. Habitat protection is the key, but we need to better understand factors that limit siren abundnace & distribution.

Total Respondents **1**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Habitat protection on public lands	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Habitat protection incentives (financial)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat restoration through regulation	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Habitat restoration on public lands	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Habitat restoration incentives (financial)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Corridor development/protection	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Managing water regimes	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Pollution reduction	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Protection of adjacent buffer zone	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Restrict public access and disturbance	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Land use planning	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Technical assistance	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Cooperative land management agreements (conservation easements)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		35

47. Other current HABITAT conservation practices for the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat in Indiana?

Habitat protection. However more research is needed to address the effectiveness of habitat retoration on siren conservation.

Corridor protection

Total Respondents **2**

Appendix E-9: Oxboxs/Backwaters/Sloughs/Embayments

49.	Do you have any additional comments or information on the Wildlife in Oxbows/Backwaters/Sloughs/Embayments Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

We need to learn a lot more about lesser sirens in order to develop a good conservation design.

Total Respondents **1**

6. Please rank the following threats to the Wildlife in Rivers and Streams Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
High sensitivity to pollution	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	**4**
Bioaccumulation of contaminants	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	**4**
Predators (native or domesticated)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	50% (2)	0% (0)	0% (0)	50% (2)	0% (0)	**4**
					Total Respondents		44

7. Please also rank these threats to the Wildlife in Rivers and Streams Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	75% (3)	0% (0)	0% (0)	25% (1)	0% (0)	**4**
Habitat loss (feeding/foraging areas)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Small native range (high endemism)	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Large home range requirements	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Specialized reproductive behavior or low reproductive rates	0% (0)	25% (1)	0% (0)	0% (0)	75% (3)	0% (0)	**4**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**38**

8. Other threats to the Wildlife in Rivers and Streams Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Rivers and Streams Habitat in Indiana identified above.

1. Habitat loss (loss of large nesting trees)

2. 1. Loss of brood rearing habitat.
2. Loss of high quality nesting habitat.

Habitat loss
Degradation of movement/migration routes

Although not habitat specific, the inability to responsibly and proactively manage mink according to the wildlife conservation model, as opposed to reactive measures through nuisance practices, is a concern regarding the conservation of mink. This concern applies across the landscape, not just in urban and suburban environments.

Total Respondents **4**

Appendix E-10: Rivers and Streams

10. Please rank the following threats to the HABITAT of the Wildlife in Rivers and Streams Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Counterproductive financial incentives or regulations	0% (0)	25% (1)	25% (1)	0% (0)	25% (1)	25% (1)	**4**
Invasive/non-native species	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Habitat fragmentation	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Successional change	0% (0)	50% (2)	0% (0)	0% (0)	50% (2)	0% (0)	**4**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Habitat degradation	0% (0)	75% (3)	0% (0)	0% (0)	25% (1)	0% (0)	**4**
Climate change	0% (0)	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	**4**
Stream channelization	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Impoundment of water/flow regulation	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Agricultural/forestry practices	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Residual contamination (persistent toxins)	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	**4**
Point source pollution (continuing)	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	**4**
Mining/acidification	0% (0)	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	**4**
Drainage practices (stormwater runoff)	25% (1)	0% (0)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Unknown	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**67**

11. Other HABITAT threats to the Wildlife in Rivers and Streams Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Rivers and Streams Habitat in Indiana identified above.

1. Stream channelization removing nesting sites and destroying brood habitat. Soil runoff caused by poor agricultural practices and urban development.

2. 1. Channelization removes and/or changes the vegetative and invertabrate communities. Channelization also alters the natural water flow which results in a much degraded habitat.
2. The loss of bottomland hardwoods continues to be a threat. These area provide a high quality food source and nesting sites for woodies.

3. Drainage Practices
Stream Channelization

The participant is foced to speculate about the meaning of successional and climate change. Agriculture/Forestry practices have different effects. Grouping these practices as a single category does not appropriately represent the individual practice. Point and nonpoint pollution may have a positive or negative impact.

Total Respondents **4**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Rivers and Streams Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	50% (2)	50% (2)	**4**
Statewide once a year monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Regional or local once a year monitoring conducted by state agencies	67% (2)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
		Total Respondents	**25**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Rivers and Streams Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	25% (1)	75% (3)	**4**
Statewide once a year monitoring conducted by other organizations	25% (1)	75% (3)	**4**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by other organizations	33% (1)	67% (2)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other	0% (0)	100% (3)	**3**

organizations

Total Respondents **26**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	50% (2)	0% (0)	0% (0)	25% (1)	25% (1)	**4**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Regional or local once a year monitoring conducted by state agencies	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
				Total Respondents		**25**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	50% (2)	0% (0)	0% (0)	0% (0)	50% (2)	**4**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
				Total Respondents		**25**

17. Regional or local state agency monitoring for the Wildlife in Rivers and Streams Habitat in Indiana.

1. State monitoring- banding and nest box surveys.

2. Several Fish & Wildlife Areas acroos the state perform annual wood duck banding. These properties include Hovey Lake FWA, Glendale FWA, Minnihaha FWA, Willow Slough FWA, Jasper=Pulaski FWA, LaSalle FWA, Pigeon River FWA, Tri-County FWA, and there may be others.
Many of these properties also conduct nest box monitoring activities on an annual basis.
Additionally, Indiana participates in the Harvest Information Program which can provide information about migration,population index and/or trends, as well as information about the amount of hunting pressure.

3. Hovey Lake
Tri county
Jasper Pulaski
Pigeon River
Winimac
Willow Slough
LaSalle

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Rivers and Streams Habitat in Indiana.

1. Muskatatuck NWR also perform wood duck banding operations.

2. Muscatatuck NWR

Total Respondents 2

19. Please list organizations that are monitoring the Wildlife in Rivers and Streams Habitat in Indiana.

1. IDNR
USFWS

2. USFWS

Indiana Division of Fish and Wildlife. Population monitoring efforts at the state, regional and local scales are to monitor annual trends. Monitoring programs are not limited to river and stream habitats for mink.

Total Respondents 3

20. What are the current monitoring techniques for the Wildlife in Rivers and Streams Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Modeling	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Spot mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Driving a survey route	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Mark and recapture	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Professional survey/census	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Volunteer survey/census	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Trapping (by any technique)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Representative sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Other (please specify below)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**31**

21. Other monitoring techniques for the Wildlife in Rivers and Streams Habitat in Indiana.

1. nest box survey

2. Nest box surveys

Total Respondents	**2**
(skipped this question)	1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

1. brood surveys

2. 1. Continued participation in HIP is perhaps the most cost effective method for monitoring the flyway population.
2. Banding operations help in determining the status of populations on a local or statewide level

3. Brood counts
Increased banding efforts

See #19

Total Respondents **4**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Rivers and Streams Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	25% (1)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Regional or local year-round inventory and assessment conducted by state agencies	25% (1)	75% (3)	**4**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
		Total Respondents	**32**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Rivers and Streams Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
		Total Respondents	**32**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	25% (1)	0% (0)	25% (1)	25% (1)	25% (1)	**4**
Statewide once a year inventory and assessment conducted by state agencies	25% (1)	0% (0)	25% (1)	25% (1)	25% (1)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	0% (0)	0% (0)	33% (1)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	0% (0)	0% (0)	33% (1)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
				Total Respondents		**27**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	25% (1)	0% (0)	0% (0)	0% (0)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	25% (1)	0% (0)	0% (0)	0% (0)	75% (3)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
				Total Respondents		**32**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Rivers and Streams Habitat in Indiana.

Nearly all of the river and stream habitats in Indiana fall under state and/or federal jurisdiction, so obtaining and maintiaining accurate and current information on these habitats is always occurring on a statewide basis.

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Rivers and Streams Habitat in Indiana.

Many local zoning boards, planning commissions and drainage boards also keep and maintain their own records in

regard to land use patterns within these habitats.

Total Respondents **1**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Rivers and Streams Habitat in Indiana.

IDNR
USFWS
USDA
IDEM
USACE
EPA
local government entities (area plan commissions, zoning boards etc..)

Total Respondents **1**

30. What are the current monitoring techniques for the Wildlife in Rivers and Streams Habitat in Indiana.

If a technique is not applicable to the Wildlife in Rivers and Streams Habitat, do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	25% (1)	25% (1)	0% (0)	0% (0)	0% (0)	50% (2)	**4**
Aerial photography and analysis	25% (1)	25% (1)	0% (0)	0% (0)	0% (0)	50% (2)	**4**
Systematic sampling	0% (0)	0% (0)	25% (1)	0% (0)	0% (0)	75% (3)	**4**
Property tax estimates	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regulatory information	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Participation in landuse programs	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
					Total Respondents		**32**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Rivers and Streams Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

1. gis mapping
aerial photo. and analysis

2. Developing and maintaing accurate GIS data sets on the habitat is very important.

3. spring, summer, fall and winter surveys

Total Respondents **3**

33. What is the current body of science for the Wildlife in Rivers and Streams Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	1	33%
Adequate	0	0%
Inadequate	0	0%
Nonexistent	1	33%
Other (please explain below)	1	33%
Total Respondents	3	

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Rivers and Streams Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Ecology and Management of the Wood Duck
Author = Bellrose and Holm
Date = 1994
Publisher = Stackpole Books

Response Total	Response Percent

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Rivers and Streams Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Ducks, Geese and Swans of North America
Author = Bellrose
Date = 1976
Publisher = Stackpole Books

	Response Total	Response Percent

36. What is the current HABITAT body of science for the Wildlife in Rivers and Streams Habitat in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		0	0%
Inadequate		0	0%
Nonexistent		1	33%
Other (please explain below)	The body of science is better than adequate, it is quite extensive and up to date, but by no means is it complete.	2	67%
	Total Respondents		2

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Rivers and Streams Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Wetlands
Author = Mitsch & Gosselink
Date =1993
Publisher = Van Nostrand Rheinhold

	Response Total	Response Percent

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Rivers and Streams Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Southern Forested Wetlands
Author = Messina & Conner
Date = 1998
Publisher = CRC Press LLC

	Response Total	Response Percent

39. What are the research needs for the Wildlife in Rivers and Streams Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	**4**
Distribution and abundance	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Threats (predators/competition, contamination)	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Relationship/dependence on specific habitats	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Population health (genetic and physical)	0% (0)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**25**

40. Other research needs for the Wildlife in Rivers and Streams Habitat in Indiana.

Research needs are not limited to river and stream habitats

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Rivers and Streams Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Distribution and abundance (fragmentation)	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Threats (land use change/competition, contamination/global warming)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Relationship/dependence on specific site conditions	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Growth and development of individual components of the habitat	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Other (please specify below)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**22**

42. Other HABITAT research needs for the Wildlife in Rivers and Streams Habitat in Indiana.

Affects of channelization on streambank communities and the affects on adjacent oxbows, bottomland hardwoods and other riparian areas

Total Respondents **1**

43. How well do the following conservation efforts address the threats to the Wildlife in Rivers and Streams Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	75% (3)	0% (0)	25% (1)	0% (0)	0% (0)	**4**
Population management (hunting, trapping)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Food plots	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Threats reduction	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Native predator control	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Exotic/invasive species control	0% (0)	50% (2)	0% (0)	25% (1)	25% (1)	**4**
Regulation of collecting	25% (1)	0% (0)	0% (0)	75% (3)	0% (0)	**4**
Disease/parasite management	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	**4**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Protection of migration routes	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Limiting contact with pollutants/contaminants	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Public education to reduce human disturbance	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Stocking	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**65**

44. Other current conservation practices for the Wildlife in Rivers and Streams Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

1. To best benfit the Wood Duck, one must first improve the habitat. This particular question seems redundant with #48. Therefore refer to my answer in box number 48.

2. Habitat protection
nest boxes

See #43. In addition, although not habitat specific, outreach programs are needed to effectively and accurately educate citizens about wildlife (game and non-game), the wildlife conservation model (for game and non-game), and the need for effective mink management programs.

Total Respondents **3**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Rivers and Streams Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	**4**
Habitat protection on public lands	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	**4**
Habitat protection incentives (financial)	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	**4**
Habitat restoration through regulation	75% (3)	0% (0)	25% (1)	0% (0)	0% (0)	**4**
Habitat restoration on public lands	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Habitat restoration incentives (financial)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Artificial habitat creation (artificial reefs, nesting platforms)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Succession control (fire, mowing)	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Corridor development/protection	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Managing water regimes	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Pollution reduction	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Protection of adjacent buffer zone	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Restrict public access and disturbance	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Land use planning	50 (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Technical assistance	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Cooperative land management agreements (conservation easements)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**68**

47. Other current HABITAT conservation practices for the Wildlife in rivers and streams habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	3

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Rivers and Streams Habitat in Indiana?

1. 1. Elimination of, or at the very least, reducing, the amount of stream channelization that occurs.

2. Restoration of bottomland hardwoods through the farmbill and other incentive type programs is also very good. Elimination of ditches and stream channelization

Total Respondents **2**

49. Do you have any additional comments or information on the Wildlife in Rivers and Streams Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No responses were entered for this question.

Total Respondents **0**

6. Please rank the following threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
High sensitivity to pollution	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Bioaccumulation of contaminants	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Predators (native or domesticated)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**11**

7. Please also rank these threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**11**

8. Other threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana identified above.

1. Past pollution problems
2. Dams on rivers block migration

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Invasive/non-native species	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Habitat fragmentation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Successional change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat degradation	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Stream channelization	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Impoundment of water/flow regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Agricultural/forestry practices	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**18**

11. Other HABITAT threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana identified above.

1. Sedimentation
2. Dams fragmenting habitat

Total Respondents	**1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
	Total Respondents		**8**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**

Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
		Total Respondents	**8**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**8**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**8**

17. Regional or local state agency monitoring for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

IDEM annual ecoregion sampling

Total Respondents **1**

18. Regional or local monitoring by other organizations for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

19. Please list organizations that are monitoring the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

City of Elkhart - Elkhart and St. Joseph counties

Total Respondents	**1**

20. What are the current monitoring techniques for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Spot mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Driving a survey route	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Mark and recapture	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Professional survey/census	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Volunteer survey/census	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Trapping (by any technique)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Representative sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**13**

21. Other monitoring techniques for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

Radio telemetry or mark & recapture

Total Respondents **1**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
		Total Respondents	**8**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**

Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
		Total Respondents	**8**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	**These efforts are somewhat crucial for this HABITAT**	**These efforts are slightly crucial for this HABITAT**	**These efforts are not crucial for this HABITAT**	**Unknown**	**Response Total**
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**8**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**8**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

If a technique is not applicable to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Systematic sampling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Modeling	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
						Total Respondents	**10**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

GIS mapping and aerial photography

Total Respondents	**1**

33. What is the current body of science for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**0**	**0%**
Inadequate	**0**	**0%**
Nonexistent	**1**	**100%**
Other (please explain below)	**0**	**0%**
Total Respondents	**1**	

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

	Response Total	Response Percent
Title	**0**	**0%**
Author	**0**	**0%**
Date	**0**	**0%**
Publisher	**0**	**0%**
Total Respondents	**0**	
(skipped this question)	1	

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent

Title	**0**	**0 %**
Author	**0**	**0 %**
Date	**0**	**0 %**
Publisher	**0**	**0 %**
	Total Respondents	**0**
	(skipped this question)	1

36. What is the current HABITAT body of science for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0 %**
Adequate	**0**	**0 %**
Inadequate	**0**	**0 %**
Nonexistent	**1**	**100 %**
Other (please explain below)	**0**	**0 %**
Total Respondents		**1**

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

	Response Total	Response Percent
Title	**0**	**0 %**
Author	**0**	**0 %**
Date	**0**	**0 %**
Publisher	**0**	**0 %**
Total Respondents		**0**
(skipped this question)		1

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	**0**	**0 %**
Author	**0**	**0 %**
Date	**0**	**0 %**

Appendix E-11: Rivers and Streams Great Lakes Drainage Great River

Publisher	**0**	**0 %**
	Total Respondents	**0**
	(skipped this question)	1

39. What are the research needs for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Distribution and abundance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Threats (predators/competition, contamination)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Relationship/dependence on specific habitats	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Population health (genetic and physical)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**7**

40. Other research needs for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

41. What are the HABITAT research needs for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Distribution and abundance (fragmentation)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Threats (land use change/competition, contamination/global warming)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Relationship/dependence on specific site conditions	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Growth and development of individual components of the habitat	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**6**

42. Other HABITAT research needs for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

43. How well do the following conservation efforts address the threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Threats reduction	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Native predator control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Public education to reduce human disturbance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents	**17**

44. Other current conservation practices for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

Appendix E-11: Rivers and Streams Great Lakes Drainage Great River

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

Protection of migration routes

Total Respondents 1

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Habitat protection on public lands	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Habitat protection incentives (financial)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Habitat restoration through regulation	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Habitat restoration on public lands	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Habitat restoration incentives (financial)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Corridor development/protection	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Managing water regimes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Pollution reduction	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of adjacent buffer zone	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Restrict public access and disturbance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Land use planning	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Technical assistance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Cooperative land management agreements (conservation easements)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents	**18**

47. Other current HABITAT conservation practices for the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Great Rivers of the Great Lakes Drainage Habitat in Indiana?

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

49. Do you have any additional comments or information on the Wildlife in Great Rivers of the Great Lakes Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

6. Please rank the following threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	**3**
High sensitivity to pollution	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Bioaccumulation of contaminants	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Predators (native or domesticated)	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
					Total Respondents		**33**

7. Please also rank these threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**29**

8. Other threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana identified above.

Exotic species competition, specifically the round goby.

Habitat degredation, non-point sources runoff resulting from loss of riparian buffers due to developement.

High sediment loads during spring rains

Total Respondents **3**

10. Please rank the following threats to the HABITAT of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Invasive/non-native species	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	0% (0)	**3**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Habitat fragmentation	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Successional change	0% (0)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Habitat degradation	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Stream channelization	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Agricultural/forestry practices	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	**3**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**50**

11. Other HABITAT threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana identified above.

Invasive species competition, specifically round goby interactions. Stream channelazation resulting in loss of habitat.

Invasive species, non-point source pollution

Sedimentation
Loss of habitat due to development in headwater areas

Total Respondents **3**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	100% (3)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	67% (2)	33% (1)	**3**
		Total Respondents	**24**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by other	0% (0)	100% (3)	**3**

organizations			
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regional or local once a year monitoring conducted by state agencies	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
				Total Respondents		**24**

17. Regional or local state agency monitoring for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

IDNR-Fish and Wildlife, Lake Michigan Fisheries office

Headwater streams surveys were conducted in 2001 through 2004 by IDNR-Fish and Wildife, Lake Michigan Fisheries Office.

IDEM ecoregion sampling

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

City of Elkhart-Elkhart & St. Joseph counties

Total Respondents **1**

19. Please list organizations that are monitoring the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

IDNR-Fish and Wildlife.

Total Respondents 1

20. What are the current monitoring techniques for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Modeling	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Spot mapping	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Mark and recapture	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Professional survey/census	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Volunteer survey/census	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Trapping (by any technique)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Representative sites	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Probabilistic sites	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**36**

21. Other monitoring techniques for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Appendix E-12: Rivers and Streams Great Lakes Drainage Headwater

Total Respondents	**0**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

Stream sampling using electrofishing techniques and seining. This should be done every 5 years to get a clear picture of changes that occur to habitat, water quality and invasive species introductions and distribution.

Rotational sampling at reference sites along the headwaters. Historical comparisons from the early 80's will be compared with the sampling that was completed 2001-2004.

Total Respondents **2**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	100% (3)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	67% (2)	33% (1)	**3**
		Total Respondents	**24**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
				Total Respondents		**24**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

Trail Creek, East Branch of Little Calumet river, Reynolds Creek, Salt Creek, West Branch of Little Calument River, Deep River.

IDEM ecoregion surveys

Total Respondents **2**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

City of Elkhart

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

IDNR-Fish and Wildlife, USFWS

IDNR-Fish and Wildlife, Lake Michigan Fisheries Office

Total Respondents 2

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

If a technique is not applicable to the Wildlife in Headwaters of the Great Lakes Drainage Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Aerial photography and analysis	0% (0)	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Systematic sampling	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
State revenue data	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regulatory information	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Participation in landuse programs	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Modeling	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
						Total Respondents	**28**

31.	Other HABITAT inventory and assessment techniques for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

IBI, and QHEI for representative sites.

Total Respondents **1**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

Sampling.

Sampling using electrofishing and seining in headwater areas. Completing IBI and QHEI and water quality analysis for these sites.

Total Respondents **2**

33. What is the current body of science for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		0	0%
Inadequate		0	0%
Nonexistent		1	33%
Other (please explain below)	Unknown in the larger scale	2	67%
	Total Respondents		3

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Fisheries Survey of the East Branch of the Little Calumet River Watershed
Author = Neil Ledet
Date = 1978
Publisher = IDNR Fisheries Section

Response Total **Response Percent**

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Stream Survey of the East Arm of the Little Calumet River
Author = Edward Braun
Date = 1974
Publisher = IDNR Division of Fish and Wildlife

Response Total **Response Percent**

36. What is the current HABITAT body of science for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%

Inadequate		1	33%
Nonexistent		1	33%
Other (please explain below)	Unknown on the larger scale	1	33%
	Total Respondents		3

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Fisheries Survey of the East Branch of the Little Calumet River Watershed
Author = Neil Ledet
Date = 1978
Publisher = IDNR Fisheries Section

Response Total **Response Percent**

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Stream Survey of the East Arm of the Little Calumet River
Author = Edward Braun
Date = 1974
Publisher = IDNR Division of Fish and Wildlife

Response Total **Response Percent**

39. What are the research needs for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Distribution and abundance	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Threats (predators/competition, contamination)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Relationship/dependence on specific habitats	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Population health (genetic and physical)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**19**

40. Other research needs for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

41. What are the HABITAT research needs for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Threats (land use change/competition, contamination/global warming)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Relationship/dependence on specific site conditions	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Growth and development of individual components of the habitat	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**16**

42. Other HABITAT research needs for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

43. How well do the following conservation efforts address the threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Food plots	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Threats reduction	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Native predator control	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Exotic/invasive species control	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Regulation of collecting	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Disease/parasite management	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Protection of migration routes	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Limiting contact with pollutants/contaminants	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Public education to reduce human disturbance	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Culling/selective removal	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Stocking	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents	**49**

44. Other current conservation practices for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

Appendix E-12: Rivers and Streams Great Lakes Drainage Headwater

Land use planning and education.
Habitat protection through landuse regulation. Agricultural runoff protection through education and landuse planning.
Total Respondents 2

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	3
Habitat protection on public lands	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	3
Habitat protection incentives (financial)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	3
Habitat restoration through regulation	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	3
Habitat restoration on public lands	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	3
Habitat restoration incentives (financial)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	3
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	3
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	3
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	3
Corridor development/protection	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	3
Managing water regimes	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	3
Pollution reduction	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	3
Protection of adjacent buffer zone	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	3
Restrict public access and disturbance	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	3
Land use planning	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	3
Technical assistance	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	3
Cooperative land management agreements (conservation easements)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	3
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
				Total Respondents		52

47. Other current HABITAT conservation practices for the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana?

Protection of habitat through land use planning. Currently most of the headwaters areas run through agricultural areas and need to maintain riparian buffer strips.

Total Respondents 1

49.	Do you have any additional comments or information on the Wildlife in Headwaters of the Great Lakes Drainage Habitat in Indiana that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

It has been over 20 years since the surverys were conducted, prior to the 2001-2004 surverys. It is important that surveys be conducted every 5 years or so to document changes to water quality, habitat and riparian zone protection.

Total Respondents **1**

6. Please rank the following threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
High sensitivity to pollution	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Bioaccumulation of contaminants	0% (0)	0% (0)	50% (2)	0% (0)	0% (0)	50% (2)	**4**
Predators (native or domesticated)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Dependence on other species (mutualism, pollinators)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	**3**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	**3**
Unregulated collection pressure	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
					Total Respondents		**35**

7. Please also rank these threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Habitat loss (feeding/foraging areas)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Viable reproductive population size or availability	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Specialized reproductive behavior or low reproductive rates	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**30**

8. Other threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

My area of expertise is effects of contamination on biological organisms, especially aquatic. This makes filling out he survey difficult. My knowleldge is applicable to aquatic habitatis rather than specific wildlife species in this survey.

Total Respondents **1**

9. Please briefly describe the top two threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana identified above.

1. The acute effects a of toxicants are recognized as a threat to organisms, but there is little knowledge on ecosystems or regional effects on chronic insults. Toxicants are more destructive to the embrolarva stages, but these are poorly documented. Pollution controls do not have definite focus on chronic effects

2. Habitat loss and pollution

Siltation- hornyhead chub are sight-feeders and mound builders for spawning;thus, muddy water will hamper their chances of survival and if the silt covers gravel and their nest, chances for successful reproduction will be limited. Competition from other wildlife species better adapted to muddy and silty stream conditions

1. Runoff, mostly agricultural
2. Instream modifications

Total Respondents 4

10. Please rank the following threats to the HABITAT of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	3
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	3
Invasive/non-native species	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	3
Nonpoint source pollution (sedimentation and nutrients)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	4
Habitat fragmentation	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	3
Successional change	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	3
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	3
Habitat degradation	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	4
Climate change	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	3
Stream channelization	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	3
Impoundment of water/flow regulation	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	3
Agricultural/forestry practices	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	4
Residual contamination (persistent toxins)	0% (0)	50% (2)	0% (0)	25% (1)	0% (0)	25% (1)	4
Point source pollution (continuing)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	0% (0)	4
Mining/acidification	0% (0)	50% (2)	0% (0)	0% (0)	50% (2)	0% (0)	4
Drainage practices (stormwater runoff)	0% (0)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	4
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	2
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
					Total Respondents		58

11. Other HABITAT threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

Riparian cooridor destruction. Loss of shading and sedimentation

Total Respondents 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana identified above.

Habitat Degradation and Nonpoint source pollution

Nonpoint source pollution- sedimentation
Agricultural practices- again sedimentation

1. Loss of riparian corridor
2. Runoff

Total Respondents **3**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	67% (2)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	67% (2)	33% (1)	**3**
		Total Respondents	**24**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**

Regional or local once a year monitoring conducted by other organizations	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	67% (2)	33% (1)	**3**
		Total Respondents	**24**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regional or local once a year monitoring conducted by state agencies	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**

Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

17. Regional or local state agency monitoring for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

IDNR periodically conducts fish stream surveys. IDEM conducts stream health surveys using fish and invertebrates.

IDEM monitors the Great Lakes Drainage once every five years; thus, they may have data available for hornyhead chub captured in the basin as part of the fish community assessments. IDNR may also sample fish communities in this area and have data on the hornyhead chub.

Maumee system

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

In some cities stream health is also assessed by fish and invertebrate surveys.

Elkhart Public Works and Utilities has a fisheries biologist on staff that actively collects fish community samples from the Great Lakes Basin (1-2 times in the summer). He may have data on the hornyhead chub as well.

Maumee system

Total Respondents **3**

19. Please list organizations that are monitoring the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

IDNR, IDEM, City of Elkhart and South Bend.

TNC

Total Respondents **2**

20. What are the current monitoring techniques for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Modeling	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Spot mapping	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Mark and recapture	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Professional survey/census	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Volunteer survey/census	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Trapping (by any technique)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Representative sites	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Probabilistic sites	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**34**

21. Other monitoring techniques for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

Professional Fish Surveys and Creel Surveys

IDEM, IDNR, and Elkhart use electrofishing equipment to sample fish communities; however, a seine could probably be used as well as tagging and radio telemetry to track the species movement.

1. Intensive quantitative sampling of known populations. Need to understand demography of wildlife species. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of wildlife species. See same for protocols.

Total Respondents **3**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	67% (2)	33% (1)	**3**
		Total Respondents	**24**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	67% (2)	33% (1)	**3**
		Total Respondents	**24**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

In all major tributaries of Lake Michigan

Like I mentioned in my survey for the Eastern Sand Darter, IDEM, IDNR, and Elkhart use the QHEI (Qualitative Habitat Evaluation Index) to assess habitat in streams.

Maumee system

Total Respondents **3**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

St. Joseph River

Maumee system

Total Respondents 2

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

IDNR, IDEM, City of Elkhart and South Bend

TNC

Total Respondents 2

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

If a technique is not applicable to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Aerial photography and analysis	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Systematic sampling	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regulatory information	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Participation in landuse programs	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Modeling	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Voluntary landowner reporting	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**

Total Respondents 29

31. Other HABITAT inventory and assessment techniques for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

Assessment using the Qualitative Habitat Evaluation Index.

1. Assess riparian corridor
2. Water quality

Total Respondents 2

33. What is the current body of science for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	3	100%
Nonexistent	0	0%
Other (please explain below)	0	0%

Total Respondents 3

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

Response Total	Response Percent

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Freshwater mussels of the Midwest
Author = Cummings & Mayer
Date = 1992
Publisher = INHS

Response Total **Response Percent**

36. What is the current HABITAT body of science for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	3	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		3

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

Response Total **Response Percent**

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Freshwater Mollusca of WI
Author = Baker
Date = 1928
Publisher = WI Geol. Nat. Hist. Survey

Response Total **Response Percent**

39. What are the research needs for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	33% (1)	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	3
Distribution and abundance	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	3
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	3
Threats (predators/competition,	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	3

contamination)							
Relationship/dependence on specific habitats	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Population health (genetic and physical)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
						Total Respondents	**25**

40. Other research needs for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

41. What are the HABITAT research needs for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Distribution and abundance (fragmentation)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Threats (land use change/competition, contamination/global warming)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Relationship/dependence on specific site conditions	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Growth and development of individual components of the habitat	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
						Total Respondents	**16**

42. Other HABITAT research needs for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

43. How well do the following conservation efforts address the threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**

Population management (hunting, trapping)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Food plots	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Threats reduction	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Native predator control	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Exotic/invasive species control	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Regulation of collecting	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Protection of migration routes	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Limiting contact with pollutants/contaminants	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Public education to reduce human disturbance	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Culling/selective removal	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Stocking	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**34**

44. Other current conservation practices for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

Habitat protection if it greatly reduced the turbidity in streams for hornyhead chub feeding and breeding behaviors. Also, exotic/invasive species control would help the hornyhead population. The hornyhead chub is sensitive to pollution so limiting contact with pollutants/contaminants would benefit the species. The hornyhead chub is also a popular bait fish, so regulation of collecting would be beneficial to the species.

Total Respondents **1**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

Habitat protection and Public Education

Habitat protection - erosion controls
Exotic species - possession of exotic species illegal (must dispose of fish properly and not release back to stream)

1. Intensive quantitative sampling of known populations. Need to understand demography of wildlife species. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of wildlife species. See same for protocols.

Total Respondents **3**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat protection on public lands	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat protection incentives (financial)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat restoration through regulation	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Habitat restoration on public lands	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat restoration incentives (financial)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Corridor development/protection	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Managing water regimes	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Pollution reduction	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Protection of adjacent buffer zone	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Restrict public access and disturbance	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Land use planning	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Technical assistance	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Cooperative land management agreements (conservation easements)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**36**

47. Other current HABITAT conservation practices for the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana.

Habitat protection and restoration on all lands by any means necessary would benefit all wildlife species (except those that are exotic and more tolerant than others) not just the hornyhead chub. Pollution reduction, protection of adjacent buffer zone, land use planning, and conservation easements would all be beneficial practices to the Hornyhead chub.

Total Respondents 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat in Indiana?

Protection and restoration of Buffer Zones

Protection of adjacent buffer zone
Nonpoint Source Pollution reduction

1. Assess riparian corridor
2. Water quality monitoring
See Watters, 2000. Proc. 1st FMCS Symposium

Total Respondents 3

49. Do you have any additional comments or information on the Wildlife in Wadeable/ Large Rivers of the Great Lakes Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

The overall smallmouth bass population in this area is somewhat poor aside from the St. Joseph River. I believe this is mostly due to the lack of habitat and loss of buffer zones. Buffer zones are vital to the health of smallmouth bass populations. They supply and protect habitat that is vital to the survival of the smallmouth bass.

IDEM has collected hornyhead chubs from the Elkhart River (Elkhart & Noble counties), St. Joseph River (Dekalb County), Cedar Creek (Allen Co.), Yellow Creek (Elkhart Co.), and Pigeon River (Lagrange Co.). If you would like the data, we can provide water chemistry, biological, and habitat data assessments.

N/A

Total Respondents 3

6. Please rank the following threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
High sensitivity to pollution	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Bioaccumulation of contaminants	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Predators (native or domesticated)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	0% (0)	**3**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
					Total Respondents		**33**

7. Please also rank these threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	67% (2)	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Habitat loss (feeding/foraging areas)	67% (2)	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Small native range (high endemism)	0% (0)	33% (1)	0% (0)	0% (0)	33% (1)	33% (1)	**3**
Near limits of natural geographic range	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Viable reproductive population size or availability	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Specialized reproductive behavior or low reproductive rates	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	67% (2)	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**27**

8. Other threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana identified above.

Pike have suffered a major loss of spawning habitat due to the prevalence of dredging within the watershed. This practice along with levee construction has resulted in the near elimination of instream an emaergent wetland vegetation throughout the majority of the watershed.

Habitat loss - requires shallow clear water with little current in weedy areas over gravel, sand, and silt to feed on insects and lay reproduce
Dredging (removal of aquatic vegetation and incresing depth of ditch)
Runoff (increases flow of stream, turbidity, and siltation of needed substrates)

Habitat loss (breeding & feeding)- the tadpole madtom feeds in dense vegetation and hides from predators in the leaf litter, dead wood, and other cover. By removing vegetation and cover in the stream, the tadpole madtom also loses spawning areas (tadpole madtoms typically lay eggs under submerged objects).
Degradation of the stream channel will also increase the velocity of the current (if straightened or cleared of debris)

which will remove the tadpole madtom's preferred current-free, quiet habitat.	
Total Respondents	**3**

10. Please rank the following threats to the HABITAT of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Invasive/non-native species	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Nonpoint source pollution (sedimentation and nutrients)	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Habitat fragmentation	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Successional change	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Diseases (of plants that create habitat)	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Habitat degradation	67% (2)	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Climate change	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Stream channelization	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Impoundment of water/flow regulation	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	0% (0)	**3**
Agricultural/forestry practices	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Residual contamination (persistent toxins)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Point source pollution (continuing)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Drainage practices (stormwater runoff)	33% (1)	0% (0)	0% (0)	33% (1)	33% (1)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**47**

11. Other HABITAT threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana identified above.

The channelization of many streams in the upper Kankakee watershed and the associated fragmentation of wetland habitat has severely altered the state of the aquatic habitat in general.

Non-point source pollution (sedimentation resulting in smothering of substrates and turbidity)
Habitat degradation (removal of vegetation and shallow water)

Stream channelization (straighting the channels to move water faster) and Habitat degradation (removal of debris in the stream to speed up the transfer of water off of the land and into the recieving stream)

Total Respondents **3**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	67% (2)	33% (1)	**3**
		Total Respondents	**24**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round monitoring conducted by other	0% (0)	100% (3)	**3**

organizations			
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**24**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
				Total Respondents		**24**

17. Regional or local state agency monitoring for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

DNR fishery surveys are occasionally conducted on the Iroquois River, the Yellow River, and the Kankakee River. IDEM occasionally samples fish for contaminants analysis for the annual Fish Consumption Advisory.

IDEM and IDNR collect fish community samples in this area; thus, they may have data on the distribution of Least darters.

IDEM monitors the Kankakee River basin once every five years to determine if the stream are supporting a well-balanced warmwater aquatic community. Tadpole madtoms may have been captured while sampling headwater streams.

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

19. Please list organizations that are monitoring the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

DNR and IDEM

Total Respondents 1

20. What are the current monitoring techniques for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Modeling	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Spot mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Mark and recapture	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Professional survey/census	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Volunteer survey/census	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Trapping (by any technique)	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Representative sites	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Probabilistic sites	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**31**

21. Other monitoring techniques for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

Periodic electrofishing surveys and mark recapture techniques probably provide the best information about the pike populations.

Representative sites or look for sites where the habitat is suitable for the least darter and seine in the vegetation over rocky substrate.

seining or kick net
electrofishing

Total Respondents	**3**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (1)	67% (2)	**3**
	Total Respondents		**24**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other	0% (0)	100% (3)	**3**

organizations			
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
		Total Respondents	**24**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	**These efforts are somewhat crucial for this HABITAT**	**These efforts are slightly crucial for this HABITAT**	**These efforts are not crucial for this HABITAT**	**Unknown**	**Response Total**
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**

Total Respondents	**16**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
				Total Respondents		**16**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

Habitat evaluations are conducted as part of general stream surveys by DNR biologists. Such surveys have been conducted on the Iroquois River, the Yellow River, and the Kankakee River.

As I stated in previous surveys, the QHEI would provide a habitat assessment for sites where least darters were collected.

IDEM conducts a habitat assessment while sampling stream for fish community assessments using the QHEI (Qualitative Habitat Evaluation Index).

Total Respondents 3

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

DNR division of Fish and Wildlife

Total Respondents 1

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?
If a technique is not applicable to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Aerial photography and analysis	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Systematic sampling	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Participation in landuse programs	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**14**

31.	Other HABITAT inventory and assessment techniques for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

Systematic sampling of the habitat along the length of the stream to provide baseline data for comparison across time. GIS mapping of restored, fully connected wetland to provide an inventory of available spawning habitat.

Total Respondents **1**

33. What is the current body of science for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	3	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		3

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Fishery, Habitat, and Recreational Use Surveys for the Kankakee River
Author = Price and Robertson
Date = 2005
Publisher = DNR - Division of Fish and Wildlife (in review)

Response Total	Response Percent

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = A fishery survey of the Kankakee River in Indiana
Author = Robertson and Ledet
Date = 1981
Publisher = DNR - Division of Fish and Wildlife

Response Total	Response Percent

36. What is the current HABITAT body of science for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	3	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		3

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Fishery, Habitat, and Recreational Use Surveys for the Kankakee River
Author = Price and Robertson
Date = 2005
Publisher = DNR - Division of Fish and Wildlife (in review)

Response Total	Response Percent

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = A fishery survey of the Kankakee River in Indiana
Author = Robertson and Ledet
Date = 1981
Publisher = DNR - Division of Fish and Wildlife

Response Total	Response Percent

39. What are the research needs for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Distribution and abundance	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Limiting factors (food, shelter, water, breeding sites)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Threats (predators/competition, contamination)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Relationship/dependence on specific habitats	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Population health (genetic and physical)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**17**

40. Other research needs for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

41. What are the HABITAT research needs for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Distribution and abundance (fragmentation)	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Threats (land use change/competition, contamination/global warming)	67% (2)	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Relationship/dependence on specific site conditions	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Growth and development of individual components of the habitat	67% (2)	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**15**

42. Other HABITAT research needs for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

43. How well do the following conservation efforts address the threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Population management (hunting, trapping)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Population enhancement (captive breeding and release)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Reintroduction (restoration)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Food plots	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Threats reduction	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Native predator control	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Regulation of collecting	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Translocation to new geographic range	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Limiting contact with pollutants/contaminants	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Public education to reduce human disturbance	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Stocking	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**32**

44. Other current conservation practices for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

Restoring the connection between the streams and the wetlands that were formerly associated with them to allow pike access to spawning areas. Current water management regimes often rely on pumping to fill restored wetlands, thus, fish passage is still restricted.

Habitat protection and the possible reintroduction of the least darter into suitable habitats that have been restored.

Habitat protection

Total Respondents **3**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Habitat protection on public lands	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Habitat protection incentives (financial)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Habitat restoration through regulation	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration on public lands	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Habitat restoration incentives (financial)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Corridor development/protection	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Managing water regimes	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Pollution reduction	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Protection of adjacent buffer zone	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Restrict public access and disturbance	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Land use planning	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Technical assistance	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Cooperative land management agreements (conservation easements)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**31**

47. Other current HABITAT conservation practices for the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

Appendix E-14: Rivers and Streams Kankakee River (Illinois River) Drainage Headwater

No responses were entered for this question.

Total Respondents	**0**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

Wetland restoration projects with connectivity to the stream or "corridor" development that allows passage to wetlands already restored. We need to move toward natural regulation of water levels instead of artificial means.

Habitat protection through regulation
Protection of adjacent buffer zone.

Habitat protection
Restrict disturbance to habitat (dredging, removal of debris)

Total Respondents 3

49. Do you have any additional comments or information on the Wildlife in Headwaters of the Kankakee River (Illinois River) Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

IDEM has captured least darters at the following locations: Ringeisen Ditch, Trib of Carpenter Cr, Keefe Ditch, Claude May Ditch, and Howe Ditch in Jasper County, Singleton Ditch in Lake Co., Weiss Ditch in Newton Co., and Minier Lateral in Benton Co.

IDEM has collected tadpole madtoms on the following streams: West Creek and Singleton Ditch in Lake County, Dausman Ditch in Kosciusko Co., Bogus Run in Starke Co., and Slough Creek in Jasper Co.

Total Respondents 2

6. Please rank the following threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
High sensitivity to pollution	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Bioaccumulation of contaminants	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Predators (native or domesticated)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
					Total Respondents		**11**

7. Please also rank these threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**10**

8. Other threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana identified above.

habitat loss/unintential take-'cleaning' and dredging of streams of the Kankakee drainage can result in a large amount of creek heelsplitters being lost
dependence on other wildlife species-require fish host to reproduce; if fish populations decrease for any of a variety of reasons, then creek heelsplitter reproduction could decrease substantially

Habitat loss - requires shallow clear water with little current in weedy areas over gravel, sand, and silt to feed on insects and lay reproduce
Dredging (removal of aquatic vegetation and incresing depth of ditch)
Runoff (increases flow of stream, turbidity, and siltation of needed substrates)

Habitat loss (breeding & feeding)- the tadpole madtom feeds in dense vegetation and hides from predators in the leaf litter, dead wood, and other cover. By removing vegetation and cover in the stream, the tadpole madtom also loses spawning areas (tadpole madtoms typically lay eggs under submerged objects).
Degradation of the stream channel will also increase the velocity of the current (if straightened or cleared of

Degradation of the stream channel will also increase the velocity of the current (if straightened or cleared of debris) which will remove the tadpole madtom's preferred current-free, quiet habitat.

Total Respondents 3

10. Please rank the following threats to the HABITAT of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	1
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
Invasive/non-native species	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	1
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Habitat fragmentation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Successional change	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Habitat degradation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Stream channelization	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Impoundment of water/flow regulation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Agricultural/forestry practices	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
Point source pollution (continuing)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Drainage practices (stormwater runoff)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
					Total Respondents		18

11. Other HABITAT threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

12. Please briefly describe the top two HABITAT threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana identified above.

habitat degradation, stream channelization-cause temporary loss of habitat and impact the mussels directly by killing them or taking them out of the habitat

Non-point source pollution (sedimentation resulting in smothering of substrates and turbidity)
Habitat degradation (removal of vegetation and shallow water)

Stream channelization (straighting the channels to move water faster) and Habitat degradation (removal of debris in the stream to speed up the transfer of water off of the land and into the recieving stream)

Total Respondents **3**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
		Total Respondents	**8**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
		Total Respondents	**8**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Occasional regional or local (less than						

once a year and not regularly scheduled) monitoring conducted by state agencies	
Total Respondents	**8**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**8**

17. Regional or local state agency monitoring for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

random locations within the Kankakee drainage

IDEM and IDNR collect fish community samples in this area; thus, they may have data on the distribution of Least darters.

IDEM monitors the Kankakee River basin once every five years to determine if the stream are supporting a well-balanced warmwater aquatic community. Tadpole madtoms may have been captured while sampling headwater streams.

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

none

Total Respondents 1

19. Please list organizations that are monitoring the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

none

Total Respondents 1

20. What are the current monitoring techniques for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Spot mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Mark and recapture	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Professional survey/census	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Volunteer survey/census	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Trapping (by any technique)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Representative sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**

Total Respondents 1

21. Other monitoring techniques for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

professional surveys using timed searches, systematic sampling (Strayer and Smith 2003)-A guide to sampling freshwater mussel populations. American Fisheries Society Monograph 8. American Fisheries Society. Bethesda, Maryland. 103 pp.

Representative sites or look for sites where the habitat is suitable for the least darter and seine in the vegetation over rocky substrate.

seining or kick net
electrofishing

Total Respondents 3

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
		Total Respondents	**8**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (1)	**1**
		Total Respondents	**8**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
				Total Respondents		**8**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**8**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

none

As I stated in previous surveys, the QHEI would provide a habitat assessment for sites where least darters were collected.

IDEM conducts a habitat assessment while sampling stream for fish community assessments using the QHEI (Qualitative Habitat Evaluation Index).

Total Respondents **3**

Appendix E-15: Rivers and Streams Kankakee River (Illinois River) Drainage Wadeable/Large River

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

none

Total Respondents 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

none

Total Respondents 1

30. What are the current HABITAT inventory and/or assessment techniques for Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Aerial photography and analysis	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Systematic sampling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**3**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

don't really think that a habitat inventory of any kind is necessary for creek heelsplitter habitat in the Kankakee drainage

Total Respondents	**1**

33. What is the current body of science for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**0**	**0%**
Inadequate	**3**	**100%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
Total Respondents		**3**

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

	Response Total	Response Percent
Title	**0**	**0%**
Author	**0**	**0%**
Date	**0**	**0%**
Publisher	**0**	**0%**
Total Respondents		**0**

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents	**0**	
(skipped this question)	1	

36. What is the current HABITAT body of science for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	1	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents	**1**	

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents	**0**	
(skipped this question)	1	

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

	Response Total	Response Percent
Title	0	0%
Author	0	0%
Date	0	0%
Publisher	0	0%
Total Respondents		0
(skipped this question)		1

39. What are the research needs for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Distribution and abundance	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Threats (predators/competition, contamination)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Relationship/dependence on specific habitats	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Population health (genetic and physical)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	1
					Total Respondents		7

40. Other research needs for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

41. What are the HABITAT research needs for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Threats (land use change/competition, contamination/global warming)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Relationship/dependence on specific site conditions	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Growth and development of individual components of the habitat	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**6**

42. Other HABITAT research needs for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

43. How well do the following conservation efforts address the threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Population management (hunting, trapping)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Threats reduction	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Native predator control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Public education to reduce human disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
Other (please specify below)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	1
					Total Respondents	17

44. Other current conservation practices for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

protect habitat by limiting the amount of dredging that occurs in the Kankakee watershed

Habitat protection and the possible reintroduction of the least darter into suitable habitats that have been restored.

Habitat protection

Total Respondents 3

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat protection on public lands	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat protection incentives (financial)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat restoration through regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat restoration on public lands	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat restoration incentives (financial)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Corridor development/protection	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Managing water regimes	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Pollution reduction	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Protection of adjacent buffer zone	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Restrict public access and disturbance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Land use planning	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Technical assistance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Cooperative land management agreements (conservation easements)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**18**

47. Other current HABITAT conservation practices for the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents 0

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat in Indiana?

any type of habitat protection/restoration-eliminate dredging

Habitat protection through regulation
Protection of adjacent buffer zone.

Habitat protection
Restrict disturbance to habitat (dredging, removal of debris)

Total Respondents **3**

49. Do you have any additional comments or information on the Wildlife in Wadeable/ Large Rivers of the Kankakee River (Illinois River) Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

IDEM has captured least darters at the following locations: Ringeisen Ditch, Trib of Carpenter Cr, Keefe Ditch, Claude May Ditch, and Howe Ditch in Jasper County, Singleton Ditch in Lake Co., Weiss Ditch in Newton Co., and Minier Lateral in Benton Co.

IDEM has collected tadpole madtoms on the following streams: West Creek and Singleton Ditch in Lake County, Dausman Ditch in Kosciusko Co., Bogus Run in Starke Co., and Slough Creek in Jasper Co.

Total Respondents **2**

6. Please rank the following threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	0% (0)	**6**
High sensitivity to pollution	0% (0)	50% (3)	50% (3)	0% (0)	0% (0)	0% (0)	**6**
Bioaccumulation of contaminants	0% (0)	50% (3)	17% (1)	17% (1)	0% (0)	17% (1)	**6**
Predators (native or domesticated)	0% (0)	0% (0)	67% (4)	33% (2)	0% (0)	0% (0)	**6**
Dependence on other species (mutualism, pollinators)	0% (0)	17% (1)	83% (5)	0% (0)	0% (0)	0% (0)	**6**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	50% (3)	17% (1)	0% (0)	33% (2)	**6**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	17% (1)	17% (1)	67% (4)	0% (0)	0% (0)	**6**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	67% (4)	33% (2)	0% (0)	**6**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	17% (1)	0% (0)	67% (4)	0% (0)	0% (0)	17% (1)	**6**
					Total Respondents		**66**

7. Please also rank these threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	17% (1)	83% (5)	0% (0)	0% (0)	0% (0)	0% (0)	**6**
Habitat loss (feeding/foraging areas)	17% (1)	83% (5)	0% (0)	0% (0)	0% (0)	0% (0)	**6**
Small native range (high endemism)	0% (0)	0% (0)	17% (1)	0% (0)	83% (5)	0% (0)	**6**
Near limits of natural geographic range	0% (0)	0% (0)	17% (1)	0% (0)	83% (5)	0% (0)	**6**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Viable reproductive population size or availability	0% (0)	67% (4)	0% (0)	17% (1)	0% (0)	17% (1)	**6**
Specialized reproductive behavior or low reproductive rates	0% (0)	33% (2)	67% (4)	0% (0)	0% (0)	0% (0)	**6**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	17% (1)	50% (3)	0% (0)	0% (0)	17% (1)	17% (1)	**6**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	50% (3)	33% (2)	17% (1)	**6**
Unknown	0% (0)	0% (0)	75% (3)	0% (0)	0% (0)	25% (1)	**4**
Other (please specify below)	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
					Total Respondents		**61**

8. Other threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Threats to the Orangethroat Darter are related to threats to the habitat. It prefers high-functioning, high quality riffle habitat in headwater streams. Headwater streams, are not always given as much protection or value as larger rivers downstream. Threats to the species colonization, such as aquatic passage problems through culverts are one threat. Threats to the species watersheds, such as pollution, clearing of the riparian vegetation, creek gravel mining, and channelization are also threats to the habitat of this species.; Threats to the Orangethroat Darter are related to threats to the habitat. It prefers high-functioning, high quality riffle habitat in headwater streams. Headwater streams, are not always given as much protection or value as larger rivers downstream. Threats to the species colonization, such as aquatic passage problems through culverts are one threat. Threats to the species watersheds, such as pollution, clearing of the riparian vegetation, creek gravel mining, and channelization are also threats to the habitat of this species.; Threats to the Orangethroat Darter are related to threats to the habitat. It prefers high-functioning, high quality riffle habitat in headwater streams. Headwater streams, are not always given as much protection or value as larger rivers downstream. Threats to the species colonization, such as aquatic passage problems through culverts are one threat. Threats to the species watersheds, such as pollution, clearing of the riparian vegetation, creek gravel mining, and channelization are also threats to the habitat of this species.

Total Respondents **1**

9. Please briefly describe the top two threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana identified above.

dredging of headwater streams
alterations of hydrology from land-use changes

1. Runoff
2. Habitat modification

The top two threats for the wildlife species are threats to migration (aquatic passage problems through stream crossing structures) and threats to the breeding habitat (high quality riffles). Threats to riffle habitat result from water quality degradation and loss of stream channel stability due to land management activities such as dredging, channelization, roads, and clearing of riparian vegetation.; The top two threats for the wildlife species are threats to migration (aquatic passage problems through stream crossing structures) and threats to the breeding habitat (high quality riffles). Threats to riffle habitat result from water quality degradation and loss of stream channel stability due to land management activities such as dredging, channelization, roads, and clearing of riparian vegetation.; The top two threats for the wildlife species are threats to migration (aquatic passage problems through stream crossing structures) and threats to the breeding habitat (high quality riffles). Threats to riffle habitat result from water quality degradation and loss of stream channel stability due to land management activities such as dredging, channelization, roads, and clearing of riparian vegetation.

Habitat loss (breeding and foraging/feeding areas): Siltation of small headwater streams is limiting the population of southern redbelly dace because the species spawn over gravel substrates. Also, the removal of vegetation could decrease food availablity to the herbivorous species. They occupy streams that have a permanent flow of clear water; thus siltation or alterations in flow regimes could also affect the species.

Total Respondents **4**

10. Please rank the following threats to the HABITAT of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Counterproductive financial incentives or regulations	25% (1)	0% (0)	0% (0)	0% (0)	50% (2)	25% (1)	**4**
Invasive/non-native species	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	0% (0)	**4**
Nonpoint source pollution (sedimentation and nutrients)	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Habitat fragmentation	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Successional change	0% (0)	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	**4**
Habitat degradation	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Climate change	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Stream channelization	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Impoundment of water/flow regulation	25% (1)	25% (1)	0% (0)	50% (2)	0% (0)	0% (0)	**4**
Agricultural/forestry practices	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Residual contamination (persistent toxins)	0% (0)	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Point source pollution (continuing)	0% (0)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Mining/acidification	0% (0)	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	**4**
Drainage practices (stormwater runoff)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**65**

11. Other HABITAT threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana identified above.

Runoff, mostly agricultural
Channelization

Top two threats from the list up above are habitat degradation and stream channelization

Non-point source pollution in the form of sedimentation
Destruction of clear shaded waters by forestry/agricultural practices or stream channelization.

Total Respondents **3**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (5)	**5**
Statewide once a year monitoring conducted by state agencies	20% (1)	80% (4)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	20% (1)	80% (4)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	40% (2)	60% (3)	**5**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (5)	**5**
Regional or local once a year monitoring conducted by state agencies	20% (1)	80% (4)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	40% (2)	60% (3)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	80% (4)	20% (1)	**5**
		Total Respondents	**40**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Regional or local once a year monitoring conducted by other organizations	40% (2)	60% (3)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	40% (2)	60% (3)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	80% (4)	20% (1)	**5**
		Total Respondents	**40**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	40% (2)	0% (0)	40% (2)	20% (1)	**5**
Statewide once a year monitoring conducted by state agencies	40% (2)	20% (1)	0% (0)	20% (1)	20% (1)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	40% (2)	40% (2)	0% (0)	0% (0)	20% (1)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	40% (2)	40% (2)	0% (0)	0% (0)	20% (1)	**5**
Regional or local year-round monitoring conducted by state agencies	0% (0)	40% (2)	20% (1)	20% (1)	20% (1)	**5**
Regional or local once a year monitoring conducted by state agencies	40% (2)	20% (1)	0% (0)	20% (1)	20% (1)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	**5**
Occasional regional or local (less than						

once a year and not regularly scheduled) monitoring conducted by state agencies	
Total Respondents	**40**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	40% (2)	20% (1)	20% (1)	20% (1)	**5**
Statewide once a year monitoring conducted by other organizations	40% (2)	0% (0)	20% (1)	20% (1)	20% (1)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	40% (2)	0% (0)	20% (1)	20% (1)	20% (1)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	40% (2)	0% (0)	20% (1)	20% (1)	20% (1)	**5**
Regional or local year-round monitoring conducted by other organizations	0% (0)	40% (2)	20% (1)	20% (1)	20% (1)	**5**
Regional or local once a year monitoring conducted by other organizations	40% (2)	0% (0)	20% (1)	20% (1)	20% (1)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	40% (2)	20% (1)	0% (0)	20% (1)	20% (1)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	40% (2)	40% (2)	0% (0)	0% (0)	20% (1)	**5**
				Total Respondents		**40**

17. Regional or local state agency monitoring for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

IDNR non-game biologist does mussel surveys. But, he is only one person and there are thousands of miles of streams in state.

? Wabash system

IDEM and the DNR Nongame program also conduct monitoring during the field season, once a year for fish. These above fish surveys are not specific to the Orangethroat Darter, but would include the Orangethroat Darter.; IDEM and the DNR Nongame program also conduct fish monitoring during the field season. These above fish surveys are not specific to the Orangethroat Darter, but would include the Orangethroat Darter.

IDEM monitors the health of major river basins every 5 years by looking at chemical, physical, and biological data collected at random locations within the watershed. Southern redbelly dace have been captured in the Ohio River Drainage Habitat; however, specific monitoring for the species has not occured to my knowledge by anyone state or other organization.

Appendix E-16: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Headwater

Total Respondents	**4**

18. Regional or local monitoring by other organizations for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Commmonwealth Biomonitoring frequently does habitat evaluations in small streams as part of watershed studies. If I happen to see a shell, I make a note of it in field notes. These are NOT official mussel surveys.

? Wabash system

The Hoosier National Forest conducts yearly fish surveys within two or more 5th level HUCs that encompass the Hoosier National Forest, which includes the Ohio River Drainage, Eastern Corn Belt/Interior Plateau Ecoregions. These above fish surveys are not specific to the Orangethroat Darter, but would include the Orangethroat Darter.; The Hoosier National Forest conducts yearly fish surveys within two or more 5th level HUCs that encompass the Hoosier National Forest, which includes the Ohio River Drainage, Eastern Corn Belt/Interior Plateau Ecoregions. These above fish surveys are not specific to the Orangethroat Darter, but would include the Orangethroat Darter.

Total Respondents 3

19. Please list organizations that are monitoring the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

None than I know of. Most mussel surveys are on bigger rivers. I was contacted by a college prof. interested in taking a class out to a small stream to learn about mussels. I discouraged him from doing so unless he followed DNR regulations concerning collectors' permits. I haven't heard any more from him.

consultants, perhaps TNC

USDA Forest Service, Hoosier National Forest; USDI Fish and Wildlife Service; IDEM; IDNR; USDA Forest Service, Hoosier National Forest; USDI Fish and Wildlife Service; IDEM; IDNR

Total Respondents 3

20. What are the current monitoring techniques for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Modeling	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Spot mapping	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Driving a survey route	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Mark and recapture	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Professional survey/census	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Volunteer survey/census	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Trapping (by any technique)	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Representative sites	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Probabilistic sites	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Other (please specify below)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	25% (1)	**4**
					Total Respondents		**32**

21. Other monitoring techniques for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Electro-fishing and seining are appropriate methods for monitoring the Orangethroat darter.; Electro-fishing and seining are appropriate methods for monitoring the Orangethroat darter.; Electro-fishing and seining are appropriate monitoring techniques for the Orangethroat Darter.

Total Respondents **1**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Intensive quantitative sampling of known populations. Need to understand demography of wildlife species. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of wildlife species. See same for protocols.

Electro-fishing streams..take a random sampling of streams within a watershed (5th or 6th level HUC)and standardize the stream reach length for the survey...usually 15 times the stream width. Seining is also an appropriate method for sampling, especially in the riffle habitats.; Electro-fishing streams..take a random sampling of streams within a watershed (5th or 6th level HUC)and standardize the stream reach length for the survey...usually 15 times the stream width. Seining is also an appropriate method for sampling, especially in the riffle habitats.; Electro-fishing can be used to sample stream habitats. I suggest designing a random sample of all streams within a watershed (5th or 6th level HUC). The size of the stream reach sampled would be 15 times the stream width. Seining would also be an appropriate method for sampling.

Target the habitat with seining equipment or electrofishing.

Total Respondents **3**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	25% (1)	75% (3)	**4**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (4)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	25% (1)	75% (3)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	75% (3)	25% (1)	**4**
		Total Respondents	**32**

Appendix E-16: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Headwater

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Statewide once a year inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	75% (3)	25% (1)	**4**
		Total Respondents	**32**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Statewide once a year inventory and assessment conducted by state agencies	25% (1)	25% (1)	0% (0)	25% (1)	25% (1)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	50% (2)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	50% (2)	0% (0)	25% (1)	0% (0)	25% (1)	**4**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Regional or local once a year inventory and assessment conducted by state agencies	25% (1)	0% (0)	50% (2)	0% (0)	25% (1)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
				Total Respondents		**32**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	**4**
Statewide once a year inventory and assessment conducted by other organizations	25% (1)	0% (0)	50% (2)	0% (0)	25% (1)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	0% (0)	50% (2)	0% (0)	25% (1)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	0% (0)	50% (2)	0% (0)	25% (1)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	25% (1)	50% (2)	0% (0)	25% (1)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	25% (1)	0% (0)	50% (2)	0% (0)	25% (1)	**4**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	50% (2)	0% (0)	25% (1)	0% (0)	25% (1)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**31**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

? Wabash system

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

We (Commonewealth Biomonitoring) do habitat evaluations on small streams as part of watershed studies. These evaluations are not specific to mussels, but are Ohio EPA QHEI methods.

? Wabash system

Two or more 5th level HUC watersheds a year that encompass the Hoosier National Forest are sampled; a random sampling of streams found within these 5th level HUCs occurs.

Total Respondents 3

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

consultants, perhaps TNC

IDEM, IDNR, USDA Forest Service, USDI Fish and Wildlife Service

IDEM- Qualitative Habitat Evaluations completed at sites where southern redbelly dace may have been captured as part of the fish community sampling program.

Total Respondents 3

30. If a technique is not applicable to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Aerial photography and analysis	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Systematic sampling	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Participation in landuse programs	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Modeling	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Voluntary landowner reporting	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Other (please specify below)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**22**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Qualitative Habitat Evaluation Index(QHEI); REMAP protocols for Northern Forested Streams; stream channel cross-sections and longitudinal profiles; substrate analysis; descriptions of riparian vegetation; water quality parameters are measured using probes and Hydro-labs

Total Respondents **1**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Assess riparian corridor presence
Water quality

Two protocols that I recommend for reference include the following:
1. Harrelson, C.C., C.L. Rawlins, and J.P. Potyondy. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. USDA Forest Service. General Technical Report RM-245.
The above reference offers useful guidance on measuring stream channel cross-sections and substrate within the stream. This information can be used to determine if a stream channel is stable and if the substrate is available within riffle habitats, which are the preferred habitat of the Orangethroat Darter.

2. Simon, T. P. and P.M. Stewart. 1998. Standard Operating Procedures For Development of Watershed Indicators In REMAP: Northern Lakes and Forest Streams.

The above reference is very useful for developing a watershed level sampling design and includes useful methods for measuring stream channel and stream habitat parameters.

3. The Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA is a useful qualitative field method that can be used to prioritize sites within a watershed for stream habitat or water quality improvement.

Total Respondents **2**

33. What is the current body of science for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	1	33%
Inadequate	2	67%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents	**3**	

Appendix E-16: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Headwater

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Occurrence and distribution of freshwater mussels in the small streams of Tippecanoe County, Indiana
Author = Myers-Kinzie, M., S. Wente, & A. Spacie
Date = 2001
Publisher = Proc. Ind. Acad. Sci.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Freshwater Mollusca of WI
Author = Baker
Date = 1919
Publisher = WI Geol. Nat. Hist. Surv.

36. What is the current HABITAT body of science for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	3	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		3

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

Response Total	Response Percent

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Freshwater Mollusca of WI
Author = Baker
Date = 1919
Publisher = WI Geol. Nat. Hist. Surv.

Response Total	Response Percent

39. What are the research needs for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	25% (1)	0% (0)	50% (2)	25% (1)	0% (0)	0% (0)	**4**
Distribution and abundance	0% (0)	0% (0)	75% (3)	25% (1)	0% (0)	0% (0)	**4**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Threats (predators/competition, contamination)	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Relationship/dependence on specific habitats	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Population health (genetic and physical)	0% (0)	0% (0)	50% (2)	50% (2)	0% (0)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**25**

40. Other research needs for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

1. Habitat needs are not completely understood. I have seen fresh dead cylindrical papershell in channelized ag ditches. Other small streams with good habitat have only weathered dead fragments.

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	100% (4)	0% (0)	0% (0)	0% (0)	**4**
Threats (land use change/competition, contamination/global warming)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Relationship/dependence on specific site conditions	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Growth and development of individual components of the habitat	25% (1)	0% (0)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Other (please specify below)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**22**

42. Other HABITAT research needs for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Effects of roads and stream crossings on the wildlife species; Is aquatic passage through culverts and other stream crossing structures adequate or are these crossings causing aquatic habitat fragmentation?

Total Respondents **1**

43. How well do the following conservation efforts address the threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Food plots	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Threats reduction	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Native predator control	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Exotic/invasive species control	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Regulation of collecting	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Protection of migration routes	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Limiting contact with pollutants/contaminants	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Public education to reduce human disturbance	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Stocking	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**49**

44. Other current conservation practices for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Habitat protection occurs in the form of the Clean Water Act, National Forest Management Act and other state and federal regulations that protect aquatic habitat and aquatic species. These regulations may or may not be enough for the sake of Orangethroat Darter conservation.

Total Respondents **1**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

The following applies to all mussel species. Educate anglers that it is ILLEGAL to use mussels as fishing bait.

CREP, other incentives for BMP's
Limit instream modifications
See Watters, 2000. Proc. 1st FMCS Symposium

1.Restoration of stream channels..restoring or protecting stream channel function so that riffle habitats are enhanced or protected.
2.Restoration or enhancement of riparian vegetation to enhance or protect stream channels from runoff or impacts to the channel.
3. Maintenance of roads and stream crossings so that stream channel function and aquatic passage are maintained.

Habitat protection

Total Respondents 3

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Habitat protection on public lands	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Habitat protection incentives (financial)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Habitat restoration through regulation	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Habitat restoration on public lands	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Habitat restoration incentives (financial)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Corridor development/protection	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Managing water regimes	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Pollution reduction	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Protection of adjacent buffer zone	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Restrict public access and disturbance	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Land use planning	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Technical assistance	0% (0)	100% (3)	0% (0)	0% (0)	0% (0)	**3**
Cooperative land management agreements (conservation easements)	0% (0)	67% (2)	0% (0)	33% (1)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**51**

47. Other current HABITAT conservation practices for the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

I am not aware of any of the above for which I marked "not used."

Total Respondents 1

Appendix E-16: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Headwater

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Treat small streams as biological resources and not just drainage ditches. At the very least, require that a mussel survey be done before dredging.

1. Promote riparian corridor
2. Limit habitat modifications

1.Streambank stabilization or stream restoration (reconstructing the channel to reconnect it to its natural floodplain elevation).
2. Culvert or stream crossing structure improvement (replace non-functioning culverts or other crossing structures and replace with ones that function and are at the right elevation/location within the stream's longitudinal profile).
3. Restoration of riparian vegetative communities through tree planting, etc.

Habitat protection and Protection of adjacent buffer zone

Total Respondents **4**

49. Do you have any additional comments or information on the Wildlife in Headwaters in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

N/A

IDEM has captured many southern redbelly dace in their random fish sampling program. Most of these specimens came from the Whitewater Basin in headwater streams <20 sq. miles with high gradient and high biological integrity.

Total Respondents **2**

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

6. Please rank the following threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	8% (1)	38% (5)	38% (5)	0% (0)	15% (2)	**13**
High sensitivity to pollution	23% (3)	69% (9)	8% (1)	0% (0)	0% (0)	0% (0)	**13**
Bioaccumulation of contaminants	0% (0)	0% (0)	8% (1)	38% (5)	8% (1)	46% (6)	**13**
Predators (native or domesticated)	0% (0)	8% (1)	15% (2)	46% (6)	23% (3)	8% (1)	**13**
Dependence on other species (mutualism, pollinators)	0% (0)	8% (1)	8% (1)	8% (1)	54% (7)	23% (3)	**13**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	27% (3)	0% (0)	73% (8)	**11**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	23% (3)	31% (4)	46% (6)	0% (0)	**13**
Species over population	0% (0)	0% (0)	0% (0)	15% (2)	85% (11)	0% (0)	**13**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	14% (2)	7% (1)	0% (0)	7% (1)	71% (10)	0% (0)	**14**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	15% (2)	85% (11)	0% (0)	**13**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	14% (2)	0% (0)	7% (1)	36% (5)	7% (1)	36% (5)	**14**
					Total Respondents		**144**

7. Please also rank these threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	31% (4)	46% (6)	0% (0)	8% (1)	8% (1)	8% (1)	**13**
Habitat loss (feeding/foraging areas)	15% (2)	62% (8)	0% (0)	7% (1)	7% (1)	7% (1)	**13**
Small native range (high endemism)	7% (1)	15% (2)	7% (1)	0% (0)	69% (9)	0% (0)	**13**
Near limits of natural geographic range	0% (0)	7% (1)	7% (1)	7% (1)	77% (10)	0% (0)	**13**
Large home range requirements	0% (0)	0% (0)	0% (0)	18% (2)	73% (8)	9% (1)	**11**
Viable reproductive population size or availability	7% (1)	23% (3)	0% (0)	23% (3)	38% (5)	7% (1)	**13**
Specialized reproductive behavior or low reproductive rates	0% (0)	31% (4)	7% (1)	23% (3)	31% (4)	7% (1)	**13**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	7% (1)	15% (2)	15% (2)	0% (0)	46% (6)	15% (2)	**13**
Genetic pollution (hybridization)	0% (0)	0% (0)	7% (1)	23% (3)	69% (9)	0% (0)	**13**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	**6**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
					Total Respondents		**125**

8. Other threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

High stream flows for a few months following spawning can seriously reduce year class strength.

High stream flows following spawning can seriouslyh reduce year class strength. This threat can be reduced by reducing ditching in headwaters, installing grass waterways and WASCOBS, maintaining riparian corridors. All of these measures will slow stream flows and reduce siltation.

Total Respondents **2**

9. Please briefly describe the top two threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana identified above.

Hellbenders has a small geographic range and population sizes in Indiana. In many locations there is concern about low reproductive rates, but this is unknown in Indiana populations.

1. Runoff
2. Habitat modification

1. Runoff introducing sediments, even if onl;y temporary
2. In-stream modifications

1. Pollution within the Tippecanoe River system in Indiana.

2. Any factor which reduces the reproductive population size.

1. Pollution

2. (1) Habitat loss - siltation of spawning areas and pools, loss of instream cover, reparian destruction, channelization
(2) Point source pollution which triggers fish kills or repels rock bass from the area.

3. Habitat loss and degredation are serios threats to rock bass. They prefer silt free streams to reproduce and thrive. They also relate closely to structure/cover therefore any habitat loss is a threat.

Habitat Loss - The Eastern Sand darter requires sandy bottoms in fast flowing streams to bury eggs, hide from predators, ambush prey, conserve energy, and maintain position in unstable/shifting sandbars. Low reproductive rates/small populations - reach maturity at age 1, but only lives a few years.

Breeding and feeding/foraging habitat loss due to sedimentation from farm fields and stream banks as well as the removal of natural riparian vegetation; breeding and feeding/foraging habitat loss due to sedimentation from farm fields and stream banks as well as the removal of natural riparian vegetation

(1) Habitat loss - siltation which reduces wpawning areas and fills pools, loss of instrream cover (snagging and log removal), riparian destruction which allows water to warm and will reduce opportunity for logs and woody debris to enter stream, channelization.
(2) Pollution which triggers fish kills or repels smallmouth from the area.

Total Respondents **10**

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

10. Please rank the following threats to the HABITAT of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	67% (8)	25% (3)	8% (1)	0% (0)	0% (0)	**12**
Counterproductive financial incentives or regulations	0% (0)	16% (2)	16% (2)	0% (0)	0% (0)	67% (8)	**12**
Invasive/non-native species	0% (0)	0% (0)	20% (2)	50% (5)	10% (1)	20% (2)	**10**
Nonpoint source pollution (sedimentation and nutrients)	43% (6)	36% (5)	7% (1)	7% (1)	0% (0)	7% (1)	**14**
Habitat fragmentation	25% (3)	8% (1)	50% (6)	0% (0)	0% (0)	17% (2)	**12**
Successional change	0% (0)	18% (2)	0% (0)	0% (0)	36% (4)	45% (5)	**11**
Diseases (of plants that create habitat)	0% (0)	0% (0)	10% (1)	0% (0)	50% (5)	40% (4)	**10**
Habitat degradation	50% (7)	25% (3)	17% (2)	0% (0)	0% (0)	8% (1)	**13**
Climate change	0% (0)	0% (0)	8% (1)	17% (2)	33% (4)	42% (5)	**12**
Stream channelization	62% (8)	38% (5)	0% (0)	0% (0)	0% (0)	0% (0)	**13**
Impoundment of water/flow regulation	20% (2)	20% (2)	50% (5)	10% (1)	0% (0)	0% (0)	**10**
Agricultural/forestry practices	10% (1)	80% (8)	10% (1)	0% (0)	0% (0)	100% (1)	**11**
Residual contamination (persistent toxins)	8% (1)	17% (2)	42% (5)	8% (1)	0% (0)	25% (3)	**12**
Point source pollution (continuing)	42% (5)	50% (6)	0% (0)	8% (1)	0% (0)	0% (0)	**12**
Mining/acidification	0% (0)	42% (5)	8% (1)	17% (2)	8% (1)	25% (3)	**12**
Drainage practices (stormwater runoff)	8% (1)	75% (9)	17% (2)	0% (0)	0% (0)	0% (0)	**12**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
					Total Respondents		**195**

11. Other HABITAT threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana identified above.

Habitat degradation of streams

1. Instream modifications
2. Runoff, both agricultural and residential

1. Agricultural runoff
2. Impoundment

1. Any significant sedimentation into the stream can become a major threat.

2. Any toxins or pollutants are a critical threat.
3. Any channelization which reduces the shallow (less than 1.5 feet) sand/gravel substrate can critically reduce or fragment habitat.

(1) (1) Habitat degradation - sedimentation, channelization, cover removal, riparian removal
(2) Point source pollution - waste water treatment plants and confined feeding operations.

Any practices that create more erosion/sediment depostion and eliminates instream cover is a serious threat. Therefore, I'd have to say nonpoint source pollution and habitat degredation are the most serious threats.

Habitat Degradation and stream channelization because this will directly affect the sediment transfer within the stream and microhabitat of the Eastern Sand Darter.

Breeding and feeding/foraging habitat loss due to sedimentation from farm fields and stream banks as well as the removal of natural riparian vegetation especially thru drainage maintenance activities

(1) Habitat degradation by sedimentation, channelization, cover removal, riparian removal.
(2) Point source pollution - These ecoregions have major threats from large cities causing fish kills from waste water treatment plans. Also, confined feeding operations in the rural areas are a major threat to the stream fish communities.

Total Respondents **9**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	17% (2)	83% (10)	**12**
Statewide once a year monitoring conducted by state agencies	9% (1)	91% (10)	**11**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	36% (4)	64% (7)	**11**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	64% (7)	36% (4)	**11**
Regional or local year-round monitoring conducted by state agencies	17% (2)	83% (10)	**12**
Regional or local once a year monitoring conducted by state agencies	18% (2)	82% (9)	**11**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	73% (8)	27% (3)	**11**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (11)	0% (0)	**11**
		Total Respondents	**90**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (12)	**12**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (12)	**12**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (12)	**12**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (12)	**12**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (12)	**12**
Regional or local once a year monitoring conducted by other organizations	25% (3)	75% (9)	**12**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	17% (2)	83% (10)	**12**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other	58% (7)	42% (5)	**12**

organizations

Total Respondents **96**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	18% (2)	0% (0)	18% (2)	64% (7)	0% (0)	**11**
Statewide once a year monitoring conducted by state agencies	10% (1)	10% (1)	20% (2)	60% (6)	0% (0)	**10**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	20% (2)	20% (2)	50% (5)	10% (1)	0% (0)	**10**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	60% (6)	0% (0)	40% (4)	0% (0)	**10**
Regional or local year-round monitoring conducted by state agencies	9% (1)	27% (3)	18% (2)	45% (5)	0% (0)	**11**
Regional or local once a year monitoring conducted by state agencies	0% (0)	30% (3)	60% (6)	10% (1)	0% (0)	**10**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	10% (1)	50% (5)	30% (3)	10% (1)	0% (0)	**10**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	18% (2)	55% (6)	9% (1)	18% (2)	0% (0)	**11**
				Total Respondents		**83**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	10% (1)	20% (2)	60% (6)	10% (1)	**10**
Statewide once a year monitoring conducted by other organizations	0% (0)	10% (1)	20% (2)	60% (6)	10% (1)	**10**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	20% (2)	20% (2)	50% (5)	10% (1)	**10**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	11% (1)	22% (2)	56% (5)	11% (1)	**9**
Regional or local year-round monitoring conducted by other organizations	0% (0)	10% (1)	30% (3)	50% (5)	10% (1)	**10**
Regional or local once a year monitoring conducted by other organizations	0% (0)	10% (1)	40% (4)	40% (4)	10% (1)	**10**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	20% (2)	20% (2)	50% (5)	10% (1)	**10**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	9% (1)	36% (4)	45% (5)	9% (1)	**11**
					Total Respondents	**80**

17. Regional or local state agency monitoring for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

IDNR Fish & Wildlife Division

Wabash system

Tippecanoe River, Maumee system

Periodic (usually annual) monitoring in the Tippecanoe River by IDNR.

1. Blue River (Harrison County)
Sugar Creek (Shelby County)
Indian Creek (Greene County)

2. (1) IN early to mid 1990's, Division of Fish and Wildlife conducted fish community inventories on the major streams throughout the state.
(2) Game fish population estimates (including rock bass) have been conducted on 5 streams every other year from 1998 through 2004.

3. various streams throughout the region, some are sampled more regularly than others

IDEM Probabilistic sampling

Indiana DNR Special Studies on T&E species- IDNR, Brant Fisher, did a study on the population of Eastern Sand Darters in Indiana over the past five years. IDNR- regional fish collection surveys may have collected some specimens of the Eastern Sand Darter. Indiana Department of Environmental Management (IDEM) occasionally collected Eastern Sand Darters as part of their Surface Water Quality Monitoring Strategy evaluating fish community structure in certain watersheds every 5 years.

See IDEM OWQ's Surface Water Qaulity Monitoring Strategy and project work plans and IDNR Fisheries Section Work Plans

Blue River (Harrison County)

(1) In early to mid 1990's the Division of Fish and Wildlife conducted a smallmouth bass inventory.
(2) 5 streasm have been sampled every other year from 1998 to 2004 to estimate smallmouth bass populations to determine the effect of smallmouth bass population changes due to the imposition of a 12 inch black bass size limit in 1998.

Total Respondents **12**

18. Regional or local monitoring by other organizations for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Wabash system

Tippecanoe River, Maumee system

Uncertain.

1. None known to occur that specifically target rock bass.

2. West Fork White River & tributaries(Muncie area)

Ball State University fish sampling

While collecting fish community samples to evaluate the community structure and ability of the stream to support a healthy fish community, these organizations may have collected Eastern Sand Darters: Soil and Water Conservation Districts within those Ecoregions, Purdue University, Wildcat Creek Watershed Alliance? I would check with the Scientific Collectors Permit office for a list of organizations collecting in those ecoregions and also check with the IDEM Section 319 webpage for project summaries where fish or habitat in those ecoregions were studied.

US Environmental Protection Agency; USGS Water Resources Division; Ohio River Valley Water Sanitation Commission; Midwest Biodiversity Institute, US Army Corps of Engineers; Muncie Bureau of Water Quality; City of Elkhart Water Quality; various universities; various consulting firms

None known to occur that specifically target smallmouth bass.

Total Respondents **9**

19. Please list organizations that are monitoring the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

consultants
TNC

TNC, USFWS

Uncertain.

1. DNR/DFW

2. None known that specifically target rock bass.

3. Muncie Bureau of Water Quality

See 17 & 18

DNR/DFW

None known that are specifically targeting smallmouth bass.

Total Respondents **9**

20. What are the current monitoring techniques for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	55% (6)	9% (1)	18% (2)	18% (2)	**11**
Modeling	0% (0)	7% (1)	67% (7)	7% (1)	0% (0)	18% (2)	**11**
Coverboard routes	0% (0)	0% (0)	0% (0)	10% (1)	0% (0)	90% (8)	**9**
Spot mapping	20% (2)	10% (1)	30% (3)	0% (0)	0% (0)	40% (4)	**10**
Driving a survey route	11% (1)	0% (0)	0% (0)	33% (3)	22% (2)	33% (3)	**9**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	27% (3)	9% (1)	36% (4)	9% (1)	18% (2)	**11**
Mark and recapture	17% (2)	42% (5)	25% (3)	0% (0)	0% (0)	17% (2)	**12**
Professional survey/census	67% (8)	33% (4)	0% (0)	0% (0)	0% (0)	0% (0)	**12**
Volunteer survey/census	0% (0)	50% (5)	20% (2)	10% (1)	0% (0)	20% (2)	**10**
Trapping (by any technique)	0% (0)	0% (0)	25% (1)	12% (1)	25% (2)	38% (3)	**7**
Representative sites	67% (7)	27% (3)	9% (1)	0% (0)	0% (0)	0% (0)	**11**
Probabilistic sites	42% (5)	8% (1)	42% (5)	0% (0)	0% (0)	8% (1)	**12**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
					Total Respondents		**129**

21. Other monitoring techniques for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Unintentional take could be monitored from fish kill cadaver counts if the officers could be trained to identify norther hog suckers instead of not counting them or just lumping them into the generic class of "round bodied suckers"

Total Respondents 1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Professional Survey

1. Intensive quantitative sampling of known populations. Need to understand demography of the clubshell. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of the clubshell. See same for protocols.

1. Intensive quantitative sampling of known populations. Need to understand demography of the clubshell. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of the clubshell. See same for protocols.

1. State DNR or professional census at representative or probabilistic sites.

2. Development of trained, select volunteer core to undertake surveys at probabilistic sites, particularly where the wildlife species should, or could occur and has not been documented in recent years.

1. Stream fish community surveys.
Rock bass population estimates.

2. electrofishing surveys

See where populations of the darter have been captured in the past and then with sienes or electrofishing equipment mark and recapture the darter to document habitat characteristics, water quality information, and land use characterization where the darters occur. You will need to target the habitat and not the exact location since the sandbars will probably shift over time. Look on the web for mark and recapture surveys as well as other eastern sand darter publications. I found many by just searching the web for Eastern Sand Darter.

Electrofishing results from probabilistic and representative sites

Electrofishing catch rate data
Population estimates
Angler creel surveys

(1) Stream fish community surveys - To determine smallmouth bass distribution and abundance. There may be a correlation of smallmouth abundance to the species richness to the overall fish community.
(2) Smallmouth bass population estimates.

Total Respondents 10

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	9% (1)	91% (10)	**11**
Statewide once a year inventory and assessment conducted by state agencies	9% (1)	91% (10)	**11**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	18% (2)	82% (9)	**11**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (4)	67% (7)	**11**
Regional or local year-round inventory and assessment conducted by state agencies	9% (1)	91% (10)	**11**
Regional or local once a year inventory and assessment conducted by state agencies	18% (2)	82% (9)	**11**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	33% (4)	67% (7)	**11**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	73% (8)	27% (3)	**11**
		Total Respondents	**88**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (12)	**12**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (12)	**12**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	8% (1)	92% (11)	**12**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	8% (1)	92% (11)	**12**
Regional or local year-round inventory and assessment conducted by other organizations	8% (1)	92% (11)	**12**
Regional or local once a year inventory and assessment conducted by other organizations	25% (3)	75% (9)	**12**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	25% (3)	75% (9)	**12**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	33% (4)	67% (8)	**12**
		Total Respondents	**96**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	9% (1)	9% (1)	18% (2)	45% (5)	18% (2)	**11**
Statewide once a year inventory and assessment conducted by state agencies	9% (1)	9% (1)	27% (3)	36% (4)	18% (2)	**11**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	18% (2)	45% (5)	9% (1)	18% (2)	9% (1)	**11**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	10% (1)	40% (4)	20% (2)	20% (2)	10% (1)	**10**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	9% (1)	36% (4)	45% (5)	9% (1)	**11**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	9% (1)	67% (7)	18% (2)	9% (1)	**11**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	67% (7)	18% (2)	9% (1)	9% (1)	**11**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	18% (2)	36% (4)	18% (2)	18% (2)	9% (1)	**11**
				Total Respondents		**87**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	9% (1)	27% (3)	36% (4)	27% (3)	**11**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	9% (1)	27% (3)	27% (3)	36% (4)	**11**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	9% (1)	18% (2)	36% (4)	9% (1)	27% (3)	**11**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	9% (1)	45% (5)	18% (2)	27% (3)	**11**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	18% (2)	27% (3)	36% (4)	18% (2)	**11**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	36% (4)	27% (3)	36% (4)	**11**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	27% (3)	36% (4)	9% (1)	27% (3)	**11**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	9% (1)	9% (1)	36% (4)	18% (2)	27% (3)	**11**
				Total Respondents		**88**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Wabash system

? Tippecanoe River and Maumee system

(Usually wildlife species inventories are made, with relevant habitat information)

1. Blue River (Harrison County)
Sugar Creek (Shelby County)
Indian Creek (Greene County)

2. Indiana Department of Natural Resources - Divison of Fish and Widlife
Indiana Department of Environmental Management

3. IDEM - statewide QHEI

I don't know of any Habitat Inventory or Assessment done specifically for the Eastern Sand Darter in the habitat you list; however, I do know that IDEM as well as IDNR and other organizations use the Qualitative Habitat Evaluation Index to document the habitat quality of the streams sampled for aquatic communities.

IDEM/OWQ/BSS; IDNR/FWD/FS; ORSANCO;

Blue River (Harrison County)

Indiana Dept of Natural Resources - Divison of Fish and Wildlife
Indiana Departement of Environmental Management

Total Respondents **10**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Wabash system

? Tippecanoe River and Maumee system

1. none known

2. Muncie BWQ - WFWR and and tributaries in the Muncie area

none

None known.

Total Respondents 6

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Consultants
TNC

TNC, USFWS

1. DNR/DFW

2. none known

Muncie; Elkhart; USGS/WRD

DNR/DFW

None known.

Total Respondents 7

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	9% (1)	18% (2)	45% (5)	0% (0)	0% (0)	27% (3)	**11**
Aerial photography and analysis	0% (0)	9% (1)	9% (1)	9% (1)	0% (0)	73% (8)	**11**
Systematic sampling	36% (4)	36% (4)	0% (0)	0% (0)	0% (0)	27% (3)	**11**
Property tax estimates	0% (0)	0% (0)	0% (0)	36% (4)	9% (1)	55% (6)	**11**
State revenue data	0% (0)	0% (0)	0% (0)	36% (4)	9% (1)	55% (6)	**11**
Regulatory information	0% (0)	9% (1)	0% (0)	18% (2)	0% (0)	73% (8)	**11**
Participation in landuse programs	0% (0)	27% (3)	27% (3)	10% (1)	0% (0)	36% (4)	**11**
Modeling	0% (0)	27% (3)	27% (3)	0% (0)	0% (0)	45% (5)	**11**
Voluntary landowner reporting	0% (0)	18% (2)	9% (1)	9% (1)	9% (1)	55% (6)	**11**
Other (please specify below)	20% (1)	0% (0)	0% (0)	0% (0)	0% (0)	80% (4)	**5**
					Total Respondents		**104**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Water quality monitoring

QHEI

Total Respondents **2**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Systematic survey & GIS

1. Assess riparian corridor
2. Water quality monitoring

1. CREP, farmer incentives for no-till, riparian corridors, etc.
2. Strictly control instream modifications: mining, snagging, etc.

1. More extensive use of GIS- modeled habitat probabilities.

1. QHEI

2. QHEI

More habitat inventories and assessments

QHEI
GIS

Qualitative Habitat Evaluation Index (QHEI) in conjunction with a stream community survey or sampling specifically for smallmouth bass. This can show which habitat components most strongly correlate with smallmouth bass abundance and or size structure.

Total Respondents **9**

33. What is the current body of science for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	5	50%
Inadequate	5	50%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents	**10**	

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Amphibians and reptiles from 23 counties of Indiana.
Author = Robert Brodman
Date = 2003
Publisher = Proceedings of the Indiana Academy of Science, 112: 43-54.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

Title = Federal Recovery Plan
Author = USFWS
Date = 1993
Publisher = USFWS

Title = 'Clubshell'
Author = USFW, Division of Endangered Species
Date = 12/1997
Publisher = Online

Title = A survey of fish communities and aquatic habitats at Indiana's major steams with emphasis on smallmouth bass distribution and abundance
Author = Stuart T. Shipman
Date = December 1997
Publisher = DNR fisheries section

Title = A survey of fish communities and aquatic habitats at Indiana's major streams with emphasis on smallmouth bass distribution and abundance.
Author = Stuart T. Shipman
Date = December 1997
Publisher = DNR fisheries section

Response Total	Response Percent

Title = The Fishes of Missouri
Author = William L. Plieger
Date = 1997
Publisher = Missouri Conservation Commission

Title = Handbook of freshwater fishery biology
Author = Kenneth D. Carlander
Date = 1997
Publisher = Iowa University Press

Title = Fishes of Ohio
Author = Milt Troutman
Date = 12/1997
Publisher = OSU Press

Title = A survey of fish communities and aquatic habitats at Indiana's major streams with emphasis on smallmouth bass distribution and abundance
Author = Stuart Shipman
Date = December 1997
Publisher = DNR/Fisheries section

Title = A survey of fish communities and aquatic habitats at Indiana's major streams with emphasis on smallmouth bass distribution and abundance

Author = Stuart Shipman
Date = December 1997
Publisher = IDNR

Total Respondents **11**

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Freshwater mussels of the Midwets
Author = Cummings & Mayer
Date = 1992
Publisher = INHS

Title = Field guide to freshwater mussels of Midwest
Author = Cummings & Mayer
Date = 1992
Publisher = INHS

Title = Surveys of the fish communties and aquatic habitats in 16 small streams in Indiana from 1996 through 1997.
Author = Douglas C. Keller
Date = 1999
Publisher = IDNR

	Response Total	Response Percent
Title = fishes of Tennessee Author = Etnire and Starnes Date = Publisher =		
Title = FW fishes of Canada Author = Scott & Crossman Date = Publisher =		
Title = Surveys of the fish communties and aquatic habitats in 16 small streams in Indiana from 1996 through 1997. Author = Douglas C. Keller Date = 1999 Publisher = IDNR		

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

36. What is the current HABITAT body of science for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	6	50%
Inadequate	3	25%
Nonexistent	2	17%
Other (please explain below)	1	8%
Total Respondents		12

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Naiades of Pennsylvania
Author = Ortmann
Date =1919
Publisher = Carnegie Museum

Title = Federal Recovery Plan
Author = USFWS
Date =1993
Publisher = USFWS

Title = A survey of fish communities and aquatic habitatts at Indiana's major streams with emphasis on smallmouth bass distribution and abundance.
Author = Stuart T. Shipman
Date = December 1997
Publisher = IDNR

Response Total	Response Percent

Title = A survey of fish communities and aquatic habitats at Indiana's major streams with emphasis on smallmouth bass distribution and abundance
Author = Stuart T. Shipman
Date =12/1997
Publisher = DNR/Fisheries section

Title = A survey of fish communities and aquatic habitats at Indiana's major streams with emphasis on smallmouth bass distribution and abundance
Author = Stuart T. Shipman
Date = December 1997
Publisher = IDNR

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Freshwater Mollusca of WI
Author = Baker
Date = 1929
Publisher = WI Geol. Nat. Sci. Surv.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

Title = Surveys of the fish communities and aquatic habitats in 16 small streams in Indiana from 1996 through 1997.
Author = Douglas C. Keller
Date = 1999
Publisher = IDNR

Title = Surveys of the fish communties and aquatic habitats in 16 small streams in Indiana from 1996 through 1997.
Author = Douglas C. Keller
Date = 1999
Publisher = IDNR

	Response Total	Response Percent

39. What are the research needs for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	25% (3)	8% (1)	25% (3)	8% (1)	33% (4)	0% (0)	**12**
Distribution and abundance	17% (2)	33% (4)	17% (2)	8% (1)	25% (3)	0% (0)	**12**
Limiting factors (food, shelter, water, breeding sites)	33% (4)	25% (3)	17% (2)	8% (1)	17% (2)	0% (0)	**12**
Threats (predators/competition, contamination)	8% (1)	42% (5)	17% (2)	17% (2)	17% (2)	0% (0)	**12**
Relationship/dependence on specific habitats	33% (4)	25% (3)	17% (2)	0% (0)	25% (3)	0% (0)	**12**
Population health (genetic and physical)	17% (2)	17% (2)	33% (4)	0% (0)	33% (4)	0% (0)	**12**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
					Total Respondents		**80**

40. Other research needs for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

To find out why the Clubshell has depopulated most of its former distribution in Indiana. Developing some sort of timeline (late Pleistocene, Holocene (usually archaeological), or historic) for relic valve distribution might narrow the possibilities of critical limiting factors (post-settlement siltation,etc.).

Total Respondents **1**

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

41. What are the HABITAT research needs for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	8% (1)	0% (0)	42% (5)	42% (5)	8% (1)	**12**
Distribution and abundance (fragmentation)	17% (2)	25% (3)	25% (3)	8% (1)	17% (2)	8% (1)	**12**
Threats (land use change/competition, contamination/global warming)	25% (3)	42% (5)	17% (2)	17% (2)	0% (0)	0% (0)	**12**
Relationship/dependence on specific site conditions	25% (3)	42% (5)	8% (1)	8% (1)	17% (2)	0% (0)	**12**
Growth and development of individual components of the habitat	8% (1)	17% (2)	42% (5)	0% (0)	25% (3)	8% (1)	**12**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	20% (1)	80% (4)	**5**
					Total Respondents		**65**

42. Other HABITAT research needs for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents	**0**
(skipped this question)	1

43. How well do the following conservation efforts address the threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	27% (3)	45% (5)	10% (1)	0% (0)	18% (2)	**11**
Population management (hunting, trapping)	9% (1)	36% (4)	9% (1)	27% (3)	18% (2)	**11**
Population enhancement (captive breeding and release)	0% (0)	18% (2)	0% (0)	73% (8)	9% (1)	**11**
Reintroduction (restoration)	18% (2)	27% (3)	0% (0)	45% (5)	10% (1)	**11**
Food plots	0% (0)	0% (0)	0% (0)	73% (8)	27% (3)	**11**
Threats reduction	0% (0)	27% (3)	0% (0)	55% (6)	18% (2)	**11**
Native predator control	0% (0)	0% (0)	0% (0)	91% (10)	9% (1)	**11**
Exotic/invasive species control	0% (0)	10% (1)	27% (3)	27% (3)	36% (4)	**11**
Regulation of collecting	0% (0)	55% (6)	18% (2)	18% (2)	9% (1)	**11**
Disease/parasite management	0% (0)	18% (2)	0% (0)	45% (5)	36% (4)	**11**
Translocation to new geographic range	9% (1)	18% (2)	0% (0)	64% (7)	9% (1)	**11**
Protection of migration routes	0% (0)	0% (0)	0% (0)	67% (7)	36% (4)	**11**
Limiting contact with pollutants/contaminants	27% (3)	45% (5)	0% (0)	18% (2)	7% (1)	**11**
Public education to reduce human disturbance	0% (0)	27% (3)	0% (0)	45% (5)	27% (3)	**11**
Culling/selective removal	0% (0)	27% (3)	0% (0)	73% (8)	0% (0)	**11**
Stocking	18% (2)	18% (2)	0% (0)	64% (7)	0% (0)	**11**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
				Total Respondents		**180**

44. Other current conservation practices for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Habitat protection

1. Eliminate instream modifications, including inpoundment
2. Restore riparian corridor

See Watters, 2000, Proc. 1st FMCS Symposium

See Watters, 2000. Proc. 1st FMCS Symposium

1. Strict enforcement of laws regulating instream modification; incentives to farmers.
2. Propagation

Protect the shallow sand/gravel habitat from siltation and channelization, and keep the waters free of pollutants and toxins.

1. Pollution control.
Habitat protection or enhancement.

2. Rock bass appear to be doing very well with little to no intensive management in streams where there is ample instream cover and good water quality. Therefore, habitat protection and contaminant reduction would be my recommendations.

I am not sure what you are asking in this question. The best way to conserve the eastern sand darter would be to reduce sedimentation covering the sand substrate which the darter needs to survive and reproduce. Current efforts to reduce sedimentation in streams is somewhat effective, but I'm not sure if it is enough to keep the eastern sand darter from disappearing.

Declare moratorium on channel/drainage "improvement" projects that do not mitigate losses;

Pollution control - from waste water treatment plants and confined feeding operations.
Habitat protection and enhancement.

Total Respondents **9**

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	18% (2)	45% (5)	10% (1)	0% (0)	27% (3)	**11**
Habitat protection on public lands	18% (2)	64% (7)	0% (0)	0% (0)	18% (2)	**11**
Habitat protection incentives (financial)	36% (4)	45% (5)	0% (0)	0% (0)	18% (2)	**11**
Habitat restoration through regulation	18% (2)	45% (5)	0% (0)	10% (1)	27% (3)	**11**
Habitat restoration on public lands	18% (2)	55% (6)	10% (1)	0% (0)	18% (2)	**11**
Habitat restoration incentives (financial)	36% (4)	36% (4)	10% (1)	0% (0)	18% (2)	**11**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	27% (3)	10% (1)	45% (5)	18% (2)	**11**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	8% (1)	67% (8)	25% (3)	**12**
Succession control (fire, mowing)	0% (0)	0% (0)	8% (1)	92% (11)	0% (0)	**12**
Corridor development/protection	33% (4)	25% (3)	8% (1)	9% (1)	25% (3)	**12**
Managing water regimes	0% (0)	55% (6)	0% (0)	18% (2)	27% (3)	**11**
Pollution reduction	55% (6)	27% (3)	0% (0)	0% (0)	18% (2)	**11**
Protection of adjacent buffer zone	55% (6)	18% (2)	9% (1)	0% (0)	18% (2)	**11**
Restrict public access and disturbance	0% (0)	27% (3)	36% (4)	18% (2)	18% (2)	**11**
Land use planning	9% (1)	64% (7)	90% (1)	0% (0)	18% (2)	**11**
Technical assistance	0% (0)	73% (8)	0% (0)	9% (1)	18% (2)	**11**
Cooperative land management agreements (conservation easements)	36% (4)	36% (4)	10% (1)	0% (0)	18% (2)	**11**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
				Total Respondents		**194**

47. Other current HABITAT conservation practices for the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana.

Again, I don't know if these practices are working well in Indiana, but the best way to conserve the critical habitat for the eastern sand darter would be habitat protection on all lands through whatever means necessary, habitat restoration of the floodplain would also be critical to the amount of sedimentation reaching the stream bed, managing water regimes may also impact the settling of sediments in stream (thus dam removal may be appropriate), protection of adjacent buffer zone is key to stopping deleterious effects of erosion and sedimentation in the stream, land use planning and conservation easements would also keep the runoff to a minimum.

Total Respondents **1**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat in Indiana?

Habitat protection

Appendix E-17: Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River

1. CREP and other incentives for BMP's
2. Restrict instream modifications
See Watters, 2000. Proc. 1st FMCS Symposium

1. No instream modifications.
2. Limit runoff through incentives or other means.
See Watters, 2000. Proc. 1st FMCS Symposium.

Manage pollutants and toxins, maintain available habitat through regulation and buffer zones, increase habitat through incentives, technical assistance and restoration.

1. Protection of adjacent buffer zones (riparian corridor).

2. 1) buffer/riparian zone protection - leads to improved water quality and more instream cover
2) pollution reduction - improved water quality and fewer fish kills

Habitat protection
Land use planning

Protection of adjacent buffer zones (riparian corridor). More participation would likely occur with financial incentives.

Total Respondents **8**

49. Do you have any additional comments or information on the Wildlife in Wadeable/Large Rivers in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

Too little in known about this wildlife species, especially Indiana populations.

N/A

N/A

1. To find out just why the Clubshell depopulated so much of its former range, which once included much of the interior of Indiana. Knowing this "why" should disclose a critical limiting factor, and could lead to its future preservation.
2. There is a great potential source for select avocational technical assistance (= volunteers) to undertake monitoring and survey where funding falls short.

I would definetly search the internet for more information on specific studies done on the Eastern Sand Darter; however, I could not find much on the habitat itself in the Eastern Corn Belt/Interior Plateau Ecoregions of the Ohio River Drainage. IDEM has a list of sites of where Eastern Sand Darters have been collected with water chemistry and habitat (QHEI) assessments if interested.

The length of this survey possibly destroys its usefulness as many/most experts will not have the time and or patience to do this for very many wildlife species; some may not even do it al all.

no

Total Respondents **7**

6. Please rank the following threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	22% (2)	0% (0)	22% (2)	0% (0)	0% (0)	56% (5)	**9**
High sensitivity to pollution	0% (0)	33% (3)	33% (3)	22% (2)	0% (0)	11% (1)	**9**
Bioaccumulation of contaminants	0% (0)	0% (0)	56% (5)	11% (1)	0% (0)	33% (3)	**9**
Predators (native or domesticated)	0% (0)	0% (0)	11% (1)	22% (2)	44% (4)	22% (2)	**9**
Dependence on other species (mutualism, pollinators)	22% (2)	0% (0)	0% (0)	0% (0)	56% (5)	22% (2)	**9**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	11% (1)	11% (1)	78% (7)	**9**
Regulated hunting/fishing pressure (too much)	11% (1)	0% (0)	33% (3)	0% (0)	56% (5)	0% (0)	**9**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (9)	0% (0)	**9**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	22% (2)	11% (1)	11% (1)	56% (5)	0% (0)	**9**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	33% (3)	67% (6)	0% (0)	**9**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	11% (1)	44% (4)	44% (4)	**9**
					Total Respondents		**99**

7. Please also rank these threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	22% (2)	0% (0)	22% (2)	22% (2)	0% (0)	33% (3)	**9**
Habitat loss (feeding/foraging areas)	22% (2)	0% (0)	33% (3)	11% (1)	0% (0)	33% (3)	**9**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (9)	0% (0)	**9**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (9)	0% (0)	**9**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	78% (7)	22% (2)	**9**
Viable reproductive population size or availability	22% (2)	11% (1)	0% (0)	0% (0)	67% (6)	0% (0)	**9**
Specialized reproductive behavior or low reproductive rates	22% (2)	11% (1)	11% (1)	0% (0)	44% (4)	11% (1)	**9**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	11% (1)	11% (1)	11% (1)	67% (6)	**9**
Genetic pollution (hybridization)	0% (0)	0% (0)	11% (1)	0% (0)	67% (6)	22% (2)	**9**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	20% (1)	80% (4)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
					Total Respondents		**89**

8. Other threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

9. Please briefly describe the top two threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana identified above.

1. Zebra mussels
2. Instream dredging

1. Zebra mussels
2. Instream modifications

1. Pollution
2. 1. Possible lack of reproductive success as indicated by poor length frequency distribution.
   2. Possible sensitivity to pollution as indicated by its rarity in the Ohio River reach in Indiana.

habitat loss and pollution

Total Respondents **5**

10. Please rank the following threats to the HABITAT of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	0% (0)	0% (0)	50% (4)	25% (2)	25% (2)	0% (0)	**8**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	13% (1)	13% (1)	50% (4)	25% (2)	**8**
Invasive/non-native species	25% (2)	0% (0)	13% (1)	25% (2)	13% (1)	25% (2)	**8**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	33% (3)	67% (6)	0% (0)	0% (0)	0% (0)	**9**
Habitat fragmentation	0% (0)	33% (3)	11% (1)	11% (1)	22% (2)	22% (2)	**9**
Successional change	0% (0)	0% (0)	0% (0)	22% (2)	78% (7)	0% (0)	**9**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	44% (4)	56% (5)	**9**
Habitat degradation	11% (1)	33% (3)	56% (5)	0% (0)	0% (0)	0% (0)	**9**
Climate change	0% (0)	0% (0)	0% (0)	11% (1)	44% (4)	44% (4)	**9**
Stream channelization	44% (4)	22% (2)	22% (2)	11% (1)	0% (0)	0% (0)	**9**
Impoundment of water/flow regulation	33% (3)	22% (2)	44% (4)	0% (0)	0% (0)	0% (0)	**9**
Agricultural/forestry practices	0% (0)	22% (2)	56% (5)	22% (2)	0% (0)	0% (0)	**9**
Residual contamination (persistent toxins)	0% (0)	11% (1)	44% (4)	11% (1)	0% (0)	33% (3)	**9**
Point source pollution (continuing)	0% (0)	33% (3)	56% (5)	0% (0)	0% (0)	11% (1)	**9**
Mining/acidification	11% (1)	22% (2)	44% (4)	11% (1)	0% (0)	11% (1)	**9**
Drainage practices (stormwater runoff)	0% (0)	11% (1)	67% (6)	11% (1)	0% (0)	11% (1)	**9**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
					Total Respondents		**148**

11. Other HABITAT threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Sand and gravel operations could destroy preferred habitat

Total Respondents **1**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana identified above.

1. Impoundment
2. Instream modifications

1. Dredging (mining, COE)
2. Impoundment

1. Stream channelization
2. Non-point source pollution

loss of high quality riffles and outside bend deep fast runs

loss of riparian zone and siltation

Total Respondents **5**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (9)	**9**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (9)	**9**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	11% (1)	89% (8)	**9**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	22% (2)	78% (7)	**9**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (9)	**9**
Regional or local once a year monitoring conducted by state agencies	22% (2)	78% (7)	**9**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	22% (2)	78% (7)	**9**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	89% (8)	11% (1)	**9**
		Total Respondents	**72**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (9)	**9**
Statewide once a year monitoring conducted by other organizations	11% (1)	78% (8)	**9**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (9)	**9**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (9)	**9**
Regional or local year-round monitoring conducted by other organizations	22% (2)	78% (7)	**9**
Regional or local once a year monitoring conducted by other organizations	22% (2)	78% (7)	**9**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	11% (1)	89% (8)	**9**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	22% (2)	78% (7)	**9**
		Total Respondents	**72**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	33% (3)	67% (6)	0% (0)	**9**
Statewide once a year monitoring conducted by state agencies	50% (3)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	17% (1)	17% (1)	17% (1)	50% (3)	0% (0)	**6**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	33% (3)	11% (1)	56% (5)	0% (0)	**9**
Regional or local year-round monitoring conducted by state agencies	0% (0)	13% (1)	25% (2)	63% (5)	0% (0)	**8**
Regional or local once a year monitoring conducted by state agencies	33% (3)	22% (2)	0% (0)	44% (4)	0% (0)	**9**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	44% (4)	22% (2)	11% (1)	22% (2)	0% (0)	**9**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	44% (4)	0% (0)	22% (2)	33% (3)	0% (0)	**9**
				Total Respondents		**65**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	33% (3)	67% (6)	0% (0)	**9**
Statewide once a year monitoring conducted by other organizations	11% (1)	0% (0)	33% (3)	56% (5)	0% (0)	**9**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	11% (1)	33% (3)	56% (5)	0% (0)	**9**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	11% (1)	22% (2)	67% (6)	0% (0)	**9**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	22% (2)	78% (7)	0% (0)	**9**
Regional or local once a year monitoring conducted by other organizations	11% (1)	0% (0)	22% (2)	67% (6)	0% (0)	**9**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	22% (2)	11% (1)	67% (6)	0% (0)	**9**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	22% (2)	0% (0)	11% (1)	67% (6)	0% (0)	**9**
				Total Respondents		**72**

17. Regional or local state agency monitoring for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Ohio River, Wabash system

Ohio River, Wabash

1. Wabash River
West Fork White River
East Fork White River
Ohio River
2. Ohio, White and Wabash rivers
3. Occasional stream surveys

INDFW, 1999 Wabash River, 2003 East Fork White River, 2004 West Fork White River, 2004 Main Stem White River, 1993 Patoka River, 2004 Ohio River Cannelton Pool, annual commercial fish harvest monitoring.

Ohio River, Newburgh and McApline Tailwater fall/winter annual monitoring, ocassional stream surveys

Total Respondents **7**

18. Regional or local monitoring by other organizations for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Ohio River

Ohio River, Wabash

Ohio, White and Wabash rivers

Total Respondents **3**

19. Please list organizations that are monitoring the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

USFWS

USFWS
consultants

1. DNR/DFW

Electric utilities, Ball State University, Purdue University

Total Respondents **4**

20. What are the current monitoring techniques for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	25% (2)	50% (4)	0% (0)	25% (2)	0% (0)	**8**
Modeling	22% (2)	33% (3)	0% (0)	33% (3)	0% (0)	11% (1)	**9**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	**5**
Spot mapping	0% (0)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Driving a survey route	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	17% (1)	17% (1)	50% (3)	0% (0)	17% (1)	**6**
Mark and recapture	33% (3)	44% (4)	11% (1)	0% (0)	11% (1)	0% (0)	**9**
Professional survey/census	56% (5)	44% (4)	0% (0)	0% (0)	0% (0)	0% (0)	**9**
Volunteer survey/census	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Trapping (by any technique)	40% (2)	0% (0)	0% (0)	0% (0)	0% (0)	60% (3)	**5**
Representative sites	38% (3)	63% (5)	0% (0)	0% (0)	0% (0)	0% (0)	**8**
Probabilistic sites	25% (1)	0% (0)	50% (2)	0% (0)	0% (0)	25% (1)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
					Total Respondents		**76**

21. Other monitoring techniques for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Larval sampling to check for reporduction

Total Respondents **1**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

1. Intensive quantitative sampling of known populations. Need to understand demography of the clubshell. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of the clubshell. See same for protocols.

1. Intensive quantitative sampling of known populations. Need to understand demography of the clubshell. See Strayer & Smith, 2003. AFS Monogr. 8.
2. Less intensive qualitative sampling of new or not recently surveyed areas. Need to determine distribution and status of the clubshell. See same for protocols.

1. lectrofishing swift water habitats
Hoop nets

2. 1. Electrofishing river wide
2. Hoop-netting by scientists and commercial fishermen

3. periodic stream surveys

fall/winter Ohio River tailwater sampling and ocassional stream surveys

Total Respondents **6**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (9)	**9**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (9)	**9**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (9)	**9**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	11% (1)	89% (8)	**9**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (9)	**9**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (9)	**9**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (9)	**9**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	44% (4)	56% (5)	**9**
		Total Respondents	**72**

Appendix E-18: Rivers and Streams Ohio River Drainage Great River

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (7)	**7**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Regional or local year-round inventory and assessment conducted by other organizations	13% (1)	88% (7)	**8**
Regional or local once a year inventory and assessment conducted by other organizations	14% (1)	86% (6)	**7**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	13% (1)	88% (7)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	67% (6)	33% (3)	**9**
		Total Respondents	**63**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	11% (1)	11% (1)	67% (6)	11% (1)	**9**
Statewide once a year inventory and assessment conducted by state agencies	22% (2)	0% (0)	11% (1)	56% (5)	11% (1)	**9**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	13% (1)	0% (0)	13% (1)	63% (5)	13% (1)	**8**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	17% (1)	0% (0)	17% (1)	50% (3)	17% (1)	**6**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	17% (1)	67% (4)	17% (1)	**6**
Regional or local once a year inventory and assessment conducted by state agencies	17% (1)	0% (0)	0% (0)	67% (4)	17% (1)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	63% (5)	0% (0)	0% (0)	25% (2)	13% (1)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	13% (1)	0% (0)	13% (1)	63% (5)	13% (1)	**8**
				Total Respondents		**66**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	11% (1)	11% (1)	67% (6)	11% (1)	**9**

Statewide once a year inventory and assessment conducted by other organizations	11% (1)	11% (1)	0% (0)	67% (6)	11% (1)	**9**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	11% (1)	11% (1)	0% (0)	67% (6)	11% (1)	**9**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	11% (1)	11% (1)	0% (0)	67% (6)	11% (1)	**9**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	22% (2)	11% (1)	56% (5)	11% (1)	**9**
Regional or local once a year inventory and assessment conducted by other organizations	11% (1)	22% (2)	0% (0)	56% (5)	11% (1)	**9**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	44% (4)	11% (1)	11% (1)	22% (2)	11% (1)	**9**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	22% (2)	0% (0)	11% (1)	56% (5)	11% (1)	**9**
				Total Respondents		**72**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

? Ohio River, Wabash system

Ohio River, Wabash

1. West Fork White River
East Fork White River
Wabash River

2. Unknown

Total Respondents **4**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Ohio River

Ohio River, Wabash

1. West Fork White River
East Fork White River
Wabash River

2. Unknown

2. Unknown

3. USACOE Ohio River

USACOE Ohio River

Total Respondents **6**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

USFWS

USFWS
consultants

1. DNR/DFW

2. Unknown

3. USACOE Ohio River

USACOE Ohio River

Total Respondents **6**

30. If a technique is not applicable to the Wildlife in Great Rivers of the Ohio River Drainage Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	78% (7)	11% (1)	0% (0)	11% (1)	0% (0)	**9**
Aerial photography and analysis	0% (0)	44% (4)	11% (1)	22% (2)	0% (0)	22% (2)	**9**
Systematic sampling	33% (2)	50% (3)	0% (0)	0% (0)	0% (0)	25% (1)	**6**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Participation in landuse programs	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Modeling	13% (1)	75% (6)	0% (0)	0% (0)	0% (0)	13% (1)	**8**

Voluntary landowner reporting	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
					Total Respondents		**53**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

QHEI

Total Respondents **1**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

1. Assess zebra mussel infestations. Contact P. Morrison, USFWS, Parkersburg, WV

1. Zebra mussel assessment. Contact P. Morrison, USFWS, Parkersburg, WV

QHEI

1. Recording GIS information
2. Record habitat when the wildlife species is collected during a survey.

GIS mapping and aerial photography and analysis

GIS mapping and aerial photography and analysis

Total Respondents **6**

33. What is the current body of science for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	3	30%
Inadequate	6	60%
Nonexistent	1	10%
Other (please explain below)	0	0%
Total Respondents	**10**	

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Federal Recovery Plan
Author = USFWS
Date = 1991
Publisher = USFWS

Title = Freshwater mussels of Tennessee
Author = Parmalee & Bogan
Date = 1998
Publisher = U of Tennessee Press

Response **Response**

Title = Wabash River Catfish Reports
Author = Rob Columbo
Date = 2002,2003,2004,2005
Publisher = SIU/INDFW
Title = GIS mapping and aerial photography and analysis
Author = ORFMT
Date = annually since 1999
Publisher = ORFMT

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Life history and propagation...
Author = Jones & Neves
Date = 2002
Publisher = JNABS

Title = Freshwater mussels of the Midwest
Author = Cummings & Mayer
Date = 1992
Publisher = INHS

Title = numerous INDFW FMR's
Author = Numerous
Date = numerous
Publisher = INDFW

Title = various INDFW FMR's
Author = various
Date = various
Publisher = INDFW

36. What is the current HABITAT body of science for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	6	67%
Nonexistent	3	33%
Other (please explain below)	0	0%
Total Respondents		9

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana, if available. This resource may be used if further detail is needed.

Title = Federal Recovery Plan
Author = USFWS
Date =1991

Publisher = USFWS

Title = Freshwater Mollusca of WI
Author = Baker
Date =1928
Publisher = WI Geol. Nat. Hist. Surv.

Title = Ohio River Mainstem Study
Author = USACOE
Date =2000?
Publisher = USACOE

Title = Ohio River Mainstem Study
Author = USACOE
Date =2000?
Publisher = USACOE

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana. This resource may also be used if further detail is needed.

Title = Naiades of Pennsylvania
Author = Ortmann
Date = 1919
Publisher = Carnegie Museum

39. What are the research needs for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	22% (2)	11% (1)	22% (2)	33% (3)	11% (1)	0% (0)	9
Distribution and abundance	33% (3)	0% (0)	33% (3)	22% (2)	11% (1)	0% (0)	9
Limiting factors (food, shelter, water, breeding sites)	22% (2)	22% (2)	11% (1)	33% (3)	11% (1)	0% (0)	9
Threats (predators/competition, contamination)	33% (3)	11% (1)	11% (1)	33% (3)	11% (1)	0% (0)	9
Relationship/dependence on specific habitats	11% (1)	22% (2)	22% (1)	53% (3)	11% (1)	0% (0)	8
Population health (genetic and physical)	22% (2)	11% (1)	11% (1)	56% (5)	0% (0)	0% (0)	9
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	2
						Total Respondents	55

40. Other research needs for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Determine population limiting factors in the Ohio River.

Total Respondents 1

41. What are the HABITAT research needs for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	0% (0)	0% (0)	100% (8)	0% (0)	**8**
Distribution and abundance (fragmentation)	38% (3)	0% (0)	25% (2)	25% (2)	13% (1)	0% (0)	**8**
Threats (land use change/competition, contamination/global warming)	38% (3)	0% (0)	25% (2)	25% (2)	13% (1)	0% (0)	**8**
Relationship/dependence on specific site conditions	0% (0)	13% (1)	38% (3)	25% (2)	13% (1)	0% (0)	**7**
Growth and development of individual components of the habitat	13% (1)	0% (0)	38% (3)	38% (3)	13% (1)	0% (0)	**8**
Other (please specify below)	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
					Total Respondents		**42**

42. Other HABITAT research needs for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

Water quality requirements

Total Respondents **1**

43. How well do the following conservation efforts address the threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	78% (7)	0% (0)	11% (1)	11% (1)	**9**
Population management (hunting, trapping)	0% (0)	33% (3)	0% (0)	56% (5)	11% (1)	**9**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	11% (1)	89% (8)	0% (0)	**9**
Reintroduction (restoration)	0% (0)	11% (1)	11% (1)	78% (7)	0% (0)	**9**
Food plots	0% (0)	0% (0)	11% (1)	56% (5)	22% (2)	**8**
Threats reduction	0% (0)	22% (2)	11% (1)	67% (6)	0% (0)	**9**
Native predator control	0% (0)	0% (0)	11% (1)	89% (8)	0% (0)	**9**
Exotic/invasive species control	0% (0)	0% (0)	33% (3)	22% (2)	44% (4)	**9**
Regulation of collecting	0% (0)	33% (3)	44% (4)	11% (1)	11% (1)	**9**
Disease/parasite management	0% (0)	0% (0)	0% (0)	56% (5)	33% (3)	**8**
Translocation to new geographic range	0% (0)	0% (0)	11% (1)	89% (8)	0% (0)	**9**
Protection of migration routes	0% (0)	0% (0)	11% (1)	44% (4)	44% (4)	**9**
Limiting contact with pollutants/contaminants	0% (0)	57% (4)	0% (0)	43% (3)	0% (0)	**7**
Public education to reduce human disturbance	0% (0)	67% (6)	0% (0)	33% (3)	0% (0)	**9**
Culling/selective removal	0% (0)	0% (0)	11% (1)	89% (8)	0% (0)	**9**
Stocking	0% (0)	0% (0)	11% (1)	89% (8)	0% (0)	**9**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
				Total Respondents		**144**

44. Other current conservation practices for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

1. Strictly limit instream modifications
2. Remove existing dams wherever possible
See Watters, 2000. Proc. 1st FMCS Symposium

1. Limit instream modification.
2. Restore free-flowing systems
See Watters, 2000. Proc. 1st FMCS Symposium

1. Public education
2. Regulation of collecting

habitat protection/restoration and pollution control

Total Respondents **4**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	78% (7)	11% (1)	11% (1)	0% (0)	**9**
Habitat protection on public lands	0% (0)	67% (6)	11% (1)	22% (2)	0% (0)	**9**
Habitat protection incentives (financial)	0% (0)	78% (7)	0% (0)	22% (2)	0% (0)	**9**
Habitat restoration through regulation	0% (0)	67% (6)	0% (0)	22% (2)	11% (1)	**9**
Habitat restoration on public lands	0% (0)	67% (6)	0% (0)	33% (3)	0% (0)	**9**
Habitat restoration incentives (financial)	0% (0)	44% (4)	0% (0)	11% (1)	0% (0)	**5**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	33% (3)	22% (2)	44% (4)	0% (0)	**9**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	33% (3)	67% (6)	**9**
Succession control (fire, mowing)	0% (0)	0% (0)	14% (1)	86% (6)	0% (0)	**7**
Corridor development/protection	0% (0)	63% (5)	13% (1)	25% (2)	0% (0)	**8**
Managing water regimes	0% (0)	44% (4)	11% (1)	44% (4)	0% (0)	**9**
Pollution reduction	11% (1)	78% (7)	0% (0)	11% (1)	0% (0)	**9**
Protection of adjacent buffer zone	0% (0)	78% (7)	0% (0)	22% (2)	0% (0)	**9**
Restrict public access and disturbance	0% (0)	22% (2)	11% (1)	67% (6)	0% (0)	**9**
Land use planning	0% (0)	78% (7)	0% (0)	22% (2)	0% (0)	**9**
Technical assistance	0% (0)	56% (5)	11% (1)	33% (3)	0% (0)	**9**
Cooperative land management agreements (conservation easements)	0% (0)	78% (7)	11% (1)	11% (1)	0% (0)	**9**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
				Total Respondents		**150**

47. Other current HABITAT conservation practices for the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Great Rivers of the Ohio River Drainage Habitat in Indiana?

1. Restrict instream modifications
2. Restore free-flowing systems

1. Eliminate habitat modifications (in-stream dredging, channelization, etc.)
See Watters, 2000. Proc. 1st FMCS Symposium

Buffer strips
Bank stabilization

1. Non-point source pollution reduction
2. 2. riparian conservation easements

restoration of riparian zones, riffle protection/restoration

Total Respondents **5**

49. Do you have any additional comments or information on the Wildlife in Great Rivers of the Ohio River Drainage Habitat that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

N/A

N/A

no

The blue sucker population is doing well in the Wabash River and parts of the White River. Reintroduction into additional waterbodies is a possible option, but research is needed to determine why the population is heaklthy in the Wabash/White and not other Great Rivers.

Total Respondents **4**