

#### Welcome to the INCWS Questionnaire

#### **Habitats and Species**

Managing wildlife resources in a state that has experienced intense land use from agriculture, and more recently urban development, is a real challenge. Invasive species are radically changing the vast inland seas of the Great Lakes, including Lake Michigan and its tributaries. We're doing a lot of cutting edge work to keep our options open for the future, both ecologically and economically.

We are restoring a selection of species that were part of our natural and cultural history, including river otters, bald eagles, and osprey. These species uniquely lend themselves to restoration techniques because their populations had declined, but adequate habitat still existed in some parts of Indiana. Once the habitat is gone, restoration of associated wildlife species is no longer possible.

Restoring many of the other 550 species of nongame and endangered animals one at a time would be a daunting task. Therefore, we've chosen to manage for the habitat that they need to thrive. By using this strategy, we can be sure that all species will continue to have a place in the Indiana landscape. This is especially crucial for species that are so rare or unusual that we do not know much about their life history or survival requirements.

#### **Habitat Identification**

Over 100 specific habitat types have been identified in Indiana, and Indiana State University (ISU) has been contracted to research and compile data on these habitats using GIS databases. Specifically, ISU will be compiling quantitative or index information on the total acreage, geographic distribution, patch size, native vs. non-native, vegetation diversity and relative abundance, ownership, and relative condition of the habitats. Additionally, ISU is compiling historical trends in wildlife species occurrences for each of the habitat types in 1800, 1900, and 2000.

#### Wildlife Guilds and Representative Species

Using the "Indiana Academy of Science Revised Checklist of the Vertebrates of Indiana" as a guide, technical experts listed all vertebrate wildlife species with their associated habitats, forming habitat guilds. Wildlife professionals then selected wildlife species to serve as representatives of each guild. The selected species were identified, in part, to "paint a reasonable mental picture" of the associated habitat type to diverse user groups. One to three representative species were selected for each habitat. Through this process, a total of 210 representative species have been identified.

#### Items 1 through 5

The survey will begin with a request for basic information of name, organization and email. Then you will be asked to select the major taxonomic group of your expertise (e.g. Amphibians, Birds, Fish, Mammals, Mussels or Reptiles). Next you will select both a species and a habitat (to view these lists visit <a href="http://www.djcase.com/incws/habitats-species.htm">http://www.djcase.com/incws/habitats-species.htm</a>). It is pertaining to this specific species/habitat that you complete the following questions:

### **Species Population Threats in Indiana**

6. Please rank the following threats HABITAT in Indiana.	to the	SPECIES in the				
	Critical Threat	Serious Threat	Somewhat of a Threat	Slight Threat	No Threat	Unknown
Invasive/non-native species						
High sensitivity to pollution						
Bioaccumulation of contaminants						
Predators (native or domesticated)						
Dependence on other species (mutualism, pollinators)						
Diseases/parasites (of the species itself)						
Regulated hunting/fishing pressure (too much)						
Species over population						
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)						
Unregulated collection pressure						
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)						
7. Please also rank these threats to HABITAT in Indiana.	the		_ SPECIES ir	n the		
Habitat loss (breeding range)						
Habitat loss (feeding/foraging areas)						
Small native range (high endemism)						
Near limits of natural geographic range						
Large home range requirements						
Viable reproductive population size or availability						

Specialized reproductive behavior or low reproductive rates					
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)					
Genetic pollution (hybridization)					
Other (please specify below)					
8. Other threats to the	_ SPECIE	S in the	 HAE	BITAT in Ir	ndiana.
9. Please briefly describe the top two	o threats to	o the	SPECIES	in the	
9. Please briefly describe the top two HABITAT in Indian	o threats to	o the	SPECIES	in the	
9. Please briefly describe the top two HABITAT in Indian	o threats to	o the	SPECIES	in the	
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9. Please briefly describe the top two HABITAT in Indian	o threats to	o the	SPECIES	in the	

### **Habitat Threats in Indiana**

10. Please rank the following threats to the	HABITAT as it pertains to the
SPECIES in Indiana.	

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

11. Other threats to theIndiana.	HABITAT as it pertains to the _	SPECIES in
12. Please briefly describe the top tw SPECIES in Indiana.	o threats to the	HABITAT as it pertains to the
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# **Current Species Monitoring Efforts in Indiana**

13. What current monitoring efforts SPECIES in the H	by state agencies are you av HABITAT in Indiana.	vare of for the
	Yes, these efforts occur	Not aware of these efforts occurring
Statewide year-round monitoring conducted by state agencies		0
Statewide once a year monitoring conducted by state agencies		
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies		
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies		
Regional or local year-round monitoring conducted by state agencies		
Regional or local once a year monitoring conducted by state agencies		
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies		
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies		

14. What current monitoring efforts	by other organizations are you aware of for the
SPECIES in the	HABITAT in Indiana.

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

# 15. How crucial are these monitoring efforts by state agencies for the conservation of \_\_\_\_\_ SPECIES in the \_\_\_\_\_ HABITAT in Indiana.

	Very Crucial	Somewhat Crucial	Slightly Crucial	Not Crucial	Unknown
Statewide year-round monitoring conducted by state agencies					
Statewide once a year monitoring conducted by state agencies					
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies					
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies					
Regional or local year-round monitoring conducted by state agencies					
Regional or local once a year monitoring conducted by state agencies					
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies					
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies					

Statewide year-round monitoring conducted by other organizations	Crucial	Somewhat Crucial	Slightly Crucial	Not Crucial	Unknown
01 1 11					
Statewide once a year monitoring conducted by other organizations					
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations					
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations					
Regional or local year-round monitoring conducted by other organizations					
Regional or local once a year monitoring conducted by other organizations					
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations					
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations					

18. Regional or local monitoring by other organizations for HABITAT in Indiana.	SPECIES in
19. Please list organizations that are monitoring the HABITAT in Indiana.	SPECIES in
19. Please list organizations that are monitoring the HABITAT in Indiana.	SPECIES in
19. Please list organizations that are monitoring the HABITAT in Indiana.	SPECIES in
19. Please list organizations that are monitoring the HABITAT in Indiana.	SPECIES in
19. Please list organizations that are monitoring the HABITAT in Indiana.	SPECIES in

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# **Current Species Monitoring Techniques in Indiana**

20. What are the cur			for the		SPECIES in the	
If a technique is not a	HABITAT in Indiana. nnique is not applicable to the select a response in that row.		SPECIES	S in the	Н	ABITAT,
	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
Radio telemetry and tracking						
Modeling						
Coverboard routes						
Spot mapping						
Driving a survey route						
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)						
Mark and recapture						
Professional survey/census						
Volunteer survey/census						
Trapping (by any technique)						
Representative sites						
Probabilistic sites						
Other (please specify below)						

21. Other monitoring techniques for theHABITAT in Indiana.	SPECIES in the
22. What one or two monitoring techniques would you re	
Suggest both intensive and less intensive sampling methods or regionally accepted or funded. Please describe and explai further information.	, especially any methods that are nationally in why. Provide a reference or resource for

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# **Current Habitat Inventory and Assessment Efforts**

23. What current inventory and assessment efforts or activities by state agencies are you for the HABITAT as it pertains to theSPECIES in Indiana?					
Yes, these efforts occur	No effort that I'm aware of				
	Yes, these efforts occur				

24. What current inventory and assessment efforts or activities by state agencies are you awa for the HABITAT as it pertains to the SPECIES in Indiana?					
	Yes, these efforts occur	No effort that I'm aware of			
Statewide annual inventory and assessment conducted by other organizations					
Statewide once a year inventory and assessment conducted by other organizations					
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations					
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations					
Regional or local year-round inventory and assessment conducted by other organizations					
Regional or local once a year inventory and assessment conducted by other organizations					
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations					
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations					

25. How crucial are these efforts by state agencies for the conservation of the					
	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
Statewide annual inventory and assessment conducted by state agencies					
Statewide once a year inventory and assessment conducted by state agencies					
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies					
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies					
Regional or local year-round inventory and assessment conducted by state agencies					
Regional or local once a year inventory and assessment conducted by state agencies					
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies					
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state					

agencies

26. How crucial are these efforts by HABITAT as it pertains to the	. How crucial are these efforts by other organizations for the conservation ABITAT as it pertains to theSPECIES 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
Statewide annual inventory and assessment conducted by other organizations					
Statewide once a year inventory and assessment conducted by other organizations					
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations					
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations					
Regional or local year-round inventory and assessment conducted by other organizations					
Regional or local once a year inventory and assessment conducted by other organizations					
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations					
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other					

organizations

Please list where the following efforts occur in Indiana:	
27. Regional or local state agency inventory and assessment for the HABITAT it pertains to the SPECIES in Indiana?	as
29. Degional or local inventory and approximent by other experiencians for the	
28. Regional or local inventory and assessment by other organizations for the	
29. Please list organizations that are monitoring the HABITAT as it pertains to SPECIES in Indiana?	the
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# **Current Habitat Inventory & Assessment Techniques**

30. What are the current inventory and/or assessment techniques for the						
	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
GIS mapping						
Aerial photography and analysis						
Systematic sampling						
Property tax estimates						
State revenue data						
Regulatory information						
Participation in landuse programs						
Modeling						
Voluntary landowner reporting						
Other (please specify below)						
31. Other inventory a theS	and assessm PECIES in In		s for the		HABITAT as it	pertains to

22. What one or two inventory and assessment techniques would you recommend for effective conservation of the HABITAT as it pertains to the SPECIES in Indiana?  Suggest both intensive and less intensive sampling methods, especially any methods that are nationally or regionally accepted or funded. Please describe and explain why. Provide a reference or resource for further information.	

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### **Current Body of Science for Species in Indiana**

	at is the current body of science for the T in Indiana?	SPECIES in the
	Complete, up to date and extensive	
	Adequate	
	Inadequate	
	Nonexistent	
	Other (please explain below)	
	se provide a citation (title, author, date, pub SPECIES in the es may be used if further detail is needed.	lisher) that would give the best overview of the HABITAT in Indiana, if available. These
Title		
Author		
Date		
Publishe	er	
another	essible, please provide a second citation (title good overview of the SPEC , if available. These resources may be used i	CIES in the HABITAT in
Title		
Author		
Date		
Publishe	er	

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# **Current Body of Science for Habitat in Indiana**

36. Wha	at is the current body of science for the SPECIES in Indiana?	HABITAT as it pertains to the
	Complete, up to date and extensive	
	Adequate	
	Inadequate	
	Nonexistent	
	Other (please explain below)	
These r		lisher) that would give the best overview of theSPECIES in Indiana, if available.
Title		
Author		
Date		
Publishe	er	
	SPECIES in Indiana, if available. The	e, author, date, publisher) that would give ITAT as it pertains to the se resources may be used if further detail is
Title		
Author		
Date		
Publishe	er	

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### **Species Research Needs in Indiana**

39. What are the research HABITAT in Indiana?	n needs for t	he	SPEC	CIES in the _		
	Urgently needed	Greatly needed	Needed	Slightly needed	Not Needed	Unknown
Life cycle						
Distribution and abundance						
Limiting factors (food, shelter, water, breeding sites)						
Threats (predators/competition, contamination)						
Relationship/dependence on specific habitats						
Population health (genetic and physical)						
Other (please specify below)						
40. Other research needs for theIndiana?			SPECIES in ti	he	HA	BITAT in

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### **Habitat Research Needs in Indiana**

41. What are the research	in Indiana.	ne	наві	IAI as It pei	rtains to the	
	Urgently needed	Greatly needed	Needed	Slightly needed	Not Needed	Unknown
Successional changes						
Distribution and abundance (fragmentation)						
Threats (land use change/competition, contamination/global warming)						
Relationship/dependence on specific site conditions						
Growth and development of individual components of the habitat						
Other (please specify below)						
42. Other research needs	s for the in Indiana.		HABITAT as	it pertains to	o the	

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### **Current Species Conservation Practices in Indiana**

disturbance

Stocking

Culling/selective removal

Other (please specify below)

43. How well do the following conservation efforts address the threats to the SPECIES in the HABITAT in Indiana?					
	Very well	Somewhat	Not at all	Not used	Unknown
Habitat protection					
Population management (hunting, trapping)					
Population enhancement (captive breeding and release)					
Reintroduction (restoration)					
Food plots					
Threats reduction					
Native predator control					
Exotic/invasive species control					
Regulation of collecting					
Disease/parasite management					
Translocation to new geographic range					
Protection of migration routes					
Limiting contact with pollutants/contaminants					
Public education to reduce human					

44. Other current conservation practices for the HABITAT in Indiana?			SPECIES in the
45. What one or two specific practices the SPECIES in the	would you r	ecommend f	for more effective conservation of AT in Indiana?
Suggest both intensive and less intensive regionally accepted or funded. Please desfurther information.			
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### **Current Habitat Conservation Practices in Indiana**

46. How well do the following cons	servation efforts address the threats to the	_
HABITAT as it pertains to the	SPECIES in Indiana?	

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

47. Other current conservation practices SPECIES in Indiana.	for the	_ HABITAT as it pertains to the
48. What one or two specific practices we the HABITAT as it pertains Suggest both intensive and less intensive pregionally accepted or funded. Please description further information.	nins to the practices, especially any r	SPECIES in Indiana? nethods that are nationally or
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49. Do you have any additional comments or information on the species that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?				



**Survey completed**