

Survey About Threats and Conservation Needs for Fish and Wildlife Habitats in Indiana

Summary of Results – Great Lakes (Region 1)

DNR

Indiana Department
of Natural Resources



INDIANA DIVISION OF
FISH & WILDLIFE

PURDUE
UNIVERSITY



FORESTRY
AND
NATURAL
RESOURCES

Section III: Threats to Fish and Wildlife Habitats

11. How would you describe the **overall quality** of fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1)? (Check only one)

	Very Poor		Poor		Satisfactory		Good		Very good		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N	%	N	
Aquatic systems	0.0	0	33.3	18	33.3	18	27.8	15	5.6	3	0.0	0	54
Agricultural lands	0.0	0	56.3	9	31.3	5	6.3	1	6.3	1	0.0	0	16
Barren lands	20.0	1	0.0	0	80.0	4	0.0	0	0.0	0	0.0	0	5
Developed Lands	36.4	4	36.4	4	9.1	1	9.1	1	9.1	1	0.0	0	11
Forests	4.0	1	12.0	3	52.0	13	28.0	7	0.0	0	4.0	1	25
Grasslands	11.8	2	47.1	8	41.2	7	0.0	0	0.0	0	0.0	0	17
Subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wetlands	0.0	0	37.0	10	48.1	13	14.8	4	0.0	0	0.0	0	27
Total	5.2	8	33.5	52	39.4	61	18.1	28	3.2	5	0.6	1	155

12. How would you describe the total amount and overall quality of fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1) since 2005? (Check one for each line item)

Amount of fish and wildlife habitats within HABITAT since 2005

	Increase		About the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	
Aquatic systems	20.4	11	48.1	26	25.9	14	5.6	3	54
Agricultural lands	5.9	1	29.4	5	58.8	10	5.9	1	17
Barren lands	20.0	1	60.0	3	0.0	0	20.0	1	5
Developed Lands	20.0	2	20.0	2	50.0	5	10.0	1	10
Forests	8.3	2	37.5	9	41.7	10	12.5	3	24
Grasslands	5.9	1	29.4	5	52.9	9	11.8	2	17
Subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wetlands	11.1	3	25.9	7	59.3	16	3.7	1	27
Total	13.6	21	37.0	57	41.6	64	7.8	12	154

Quality of fish and wildlife habitats within HABITAT since 2005

	Increase		About the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	
Aquatic systems	20.4	11	50.0	27	27.8	15	1.9	1	54
Agricultural lands	11.8	2	35.3	6	47.1	8	5.9	1	17
Barren lands	20.0	1	20.0	1	40.0	2	20.0	1	5
Developed Lands	40.0	4	10.0	1	40.0	4	10.0	1	10
Forests	8.0	2	40.0	10	40.0	10	12.0	3	25
Grasslands	17.6	3	23.5	4	41.2	7	17.6	3	17
Subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wetlands	14.8	4	29.6	8	48.1	13	7.4	2	27
Total	17.4	27	36.8	57	38.1	59	7.7	12	155

13. How would you predict about the total amount and overall quality of fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1) over the next 10 years? (Check one for each line item)

Amount of fish and wildlife habitats within HABITAT over the next 10 years

	Increase		About the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	
Aquatic systems	20.4	11	38.9	21	31.5	17	9.3	5	54
Agricultural lands	17.6	3	17.6	3	64.7	11	0.0	0	17
Barren lands	40.0	2	0.0	0	60.0	3	0.0	0	5
Developed Lands	20.0	2	30.0	3	50.0	5	0.0	0	10
Forests	8.0	2	36.0	9	52.0	13	4.0	1	25
Grasslands	11.8	2	35.3	6	52.9	9	0.0	0	17
Subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wetlands	7.4	2	33.3	9	59.3	16	0.0	0	27
Total	15.5	24	32.9	51	47.7	74	3.9	6	155

Quality of fish and wildlife habitats within HABITAT over the next 10 years

<i>Great Lakes (Region 1)</i>	Increase		About the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	
Aquatic systems	24.1	13	25.9	14	38.9	21	11.1	6	54
Agricultural lands	17.6	3	23.5	4	58.8	10	0.0	0	17
Barren lands	40.0	2	0.0	0	60.0	3	0.0	0	5
Developed Lands	20.0	2	40.0	4	40.0	4	0.0	0	10
Forests	12.0	3	36.0	9	44.0	11	8.0	2	25
Grasslands	23.5	4	17.6	3	58.8	10	0.0	0	17
Subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wetlands	14.8	4	25.9	7	55.6	15	3.7	1	27
Total	20.0	31	26.5	41	47.7	74	5.8	9	155

14. **Currently**, to what extent do you think the following general categories of threats **apply** to fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1)? (Check one for each line item)

<i>Great Lakes (Region 1)</i>	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N	
Residential and commercial development	50.3	77	37.9	58	9.2	14	2.0	3	0.7	1	153
Agriculture and aquaculture	50.3	77	28.1	43	14.4	22	3.9	6	3.3	5	153
Energy production and mining	6.7	10	23.3	35	31.3	47	24.0	36	14.7	22	150
Transportation and service corridors	17.9	27	39.7	60	33.1	50	4.6	7	4.6	7	151
Biological resource use	7.2	11	21.1	32	43.4	66	21.1	32	7.2	11	152
Human intrusion and disturbance	30.9	47	42.8	65	19.7	30	1.3	2	5.3	8	152
Natural systems modifications	40.8	62	37.5	57	14.5	22	2.6	4	4.6	7	152
Invasives and other problematic species and genes	66.7	102	30.7	47	2.0	3	0.7	1	0.0	0	153
Pollution	36.0	54	41.3	62	18.7	28	2.0	3	2.0	3	150
Climate change and severe weather	27.6	42	32.2	49	22.4	34	9.2	14	8.6	13	152
Other stressors	12.2	17	28.1	39	32.4	45	5.0	7	22.3	31	139

15. You indicated a number of general categories as significant or moderate threats to fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1). Please indicate which of the following are specific threats to fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1) and their trends over the next 10 years. You may add additional threats you think are important using the “Other, please specify” option.

Residential and Commercial Development

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Housing and urban areas	47.7	62	41.5	54	10.0	13	0.0	0	.8	1	130	71.7	81	23.9	27	1.8	2	2.7	3	113
Commercial and industrial areas	44.6	58	46.2	60	7.7	10	1.5	2	0.0	0	130	58.8	67	36.0	41	2.6	3	2.6	3	114
Tourism and recreation areas (e.g., sites with a substantial footprint – golf courses, campgrounds, etc.)	6.3	8	35.2	45	50.8	65	6.3	8	1.6	2	128	34.8	39	55.4	62	2.7	3	7.1	8	112

Other responses listed:

Response text:

	N
City destruction of riparian habitat	1
Exotic invasive species plants, insects diseases	1
Invasive Species	1
shoreline development	1
Total responses:	4

Agriculture and Aquaculture

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Annual and perennial nontimber crops	46.1	53	36.5	42	10.4	12	3.5	4	3.5	4	115	44.1	45	41.2	42	2.9	3	11.8	12	102
Wood and pulp plantations	1.8	2	12.4	14	32.7	37	28.3	32	24.8	28	113	3.9	4	53.9	55	3.9	4	38.2	39	102
Livestock farming and ranching	25.9	30	36.2	42	21.6	25	6.9	8	9.5	11	116	35.6	37	35.6	37	7.7	8	21.2	22	104
Aquaculture	5.4	6	9.0	10	25.2	28	22.5	25	37.8	42	111	13.3	13	36.7	36	1.0	1	49.0	48	98
Conversion of habitat to annual crops	53.5	61	28.9	33	14.0	16	1.8	2	1.8	2	114	61.2	63	29.1	30	4.9	5	4.9	5	103

Other responses listed:

Response text:

	N
Ag drainage	1

agricultural tiling	1
Farm Darianiage practices	1
Loss of CRP	1
Maintenance of surface drains	1
monocultures, lack of fallow fields	1
Nutrient Loading	1
Total responses:	7

Energy Production and Mining

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Oil and gas drilling	15.9	7	18.2	8	18.2	8	22.7	10	25.0	11	44	22.5	9	42.5	17	0.0	0	35.0	14	40
Mining and quarrying	2.4	1	26.2	11	28.6	12	16.7	7	26.2	11	42	12.5	5	52.5	21	0.0	0	35.0	14	40
Renewable energy production	7.1	3	31.0	13	38.1	16	9.5	4	14.3	6	42	51.3	20	28.2	11	2.6	1	17.9	7	39
Fossil fuel energy production	32.6	14	32.6	14	7.0	3	11.6	5	16.3	7	43	32.5	13	45.0	18	0.0	0	22.5	9	40
Shale gas development (e.g., fracking)	20.5	9	11.4	5	9.1	4	15.9	7	43.2	19	44	20.5	8	33.3	13	0.0	0	46.2	18	39

Other responses listed:

Response text:	N
Human intervention	1
pipelines	1
wind farm development	1
Total responses:	3

Transportation and Service Corridors

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Roads and railroads	36.5	31	45.9	39	17.6	15	0.0	0	0.0	0	85	60.8	48	36.7	29	0.0	0	2.5	2	79
Utility and service lines	4.8	4	56.6	47	33.7	28	2.4	2	2.4	2	83	39.2	31	55.7	44	0.0	0	5.1	4	79
Flight paths	6.0	5	16.7	14	32.1	27	28.6	24	16.7	14	84	12.7	10	64.6	51	0.0	0	22.8	18	79

Shipping lanes | 4.9 | 4 | 20.7 | 17 | 20.7 | 17 | 32.9 | 27 | 20.7 | 17 | 82 | 15.6 | 12 | 50.6 | 39 | 3.9 | 3 | 29.9 | 23 | 77

Other responses listed:

Response text:	N
culverts and other barriers to migration	1
Pipelines - spills	1
Roads and RR - really related to the slight - but high impact - chance of a major spill	1
wind farms on Lake Michigan	1
Total responses:	4

Biological Resource Use

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Forestry practices (e.g., silvicultural methods leading to the lack of early successional habitat)	9.8	4	39.0	16	22.0	9	14.6	6	14.6	6	41	16.2	6	64.9	24	0.0	0	18.9	7	37

Other responses listed:

Response text:	N
Harvest	1
Total responses:	1

Human Intrusion and Disturbance

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Recreation activities (e.g., ATVs, trail use, horseback riding, high-speed boating, canoeing)	11.2	12	53.3	57	29.9	32	3.7	4	1.9	2	107	55.6	55	40.4	40	1.0	1	3.0	3	99

Other responses listed:

Response text:	N
Habitat Destruction	1
Wind farm installation	1
Total responses:	2

Natural Systems Modification

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?											How will the significance of this threat change over the next 10 years?								
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Dams and water management/use	21.9	25	40.4	46	26.3	30	6.1	7	5.3	6	114	39.0	41	48.6	51	1.0	1	11.4	12	105
Fire and fire suppression	18.2	20	25.5	28	26.4	29	20.9	23	9.1	10	110	23.1	24	57.7	60	3.8	4	15.4	16	104
Log jam removal	13.4	15	23.2	26	28.6	32	20.5	23	14.3	16	112	30.4	31	47.1	48	2.9	3	19.6	20	102
Over-mowing of natural areas	15.3	17	36.0	40	26.1	29	11.7	13	10.8	12	111	24.5	25	55.9	57	3.9	4	15.7	16	102
Conversion of natural habitats to other land uses	65.5	74	24.8	28	8.0	9	1.8	2	0.0	0	113	72.4	76	25.7	27	1.0	1	1.0	1	105

Other responses listed:

Response text:	N
Channelization of streams	1
Excessive aquatic vegetation control	1
increased flow due to conversion to agriculture or developed use	1
installation of drain tiles	1
loss of wetlands	1
Total responses:	5

Invasives and Other Problematic Species/Genes

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?											How will the significance of this threat change over the next 10 years?								
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Invasive/alien species	72.9	102	24.3	34	1.4	2	0.0	0	1.4	2	140	92.2	118	5.5	7	.8	1	1.6	2	128
Problematic native species (e.g. overabundant native deer or algae)	26.8	38	43.0	61	22.5	32	4.2	6	3.5	5	142	44.5	57	43.8	56	3.1	4	8.6	11	128
Plant diseases	17.6	25	24.6	35	20.4	29	7.0	10	30.3	43	142	36.4	47	27.1	35	.8	1	35.7	46	129
Introduced genetic material (such as crop, seed stock, biocontrol, stocked/released species, etc.)	18.4	26	22.0	31	22.7	32	4.3	6	32.6	46	141	36.2	47	28.5	37	0.0	0	35.4	46	130

Other responses listed:

Response text:	N
exotic plants	1

Total responses:**2**

Pollution

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Runoff from roads/service corridors	34.8	39	49.1	55	11.6	13	0.0	0	4.5	5	112	58.7	61	34.6	36	0.0	0	6.7	7	104
Chemical spills	22.9	25	41.3	45	28.4	31	.9	1	6.4	7	109	27.7	28	61.4	62	1.0	1	9.9	10	101
Point source pollution from commercial/industrial sources	34.5	38	45.5	50	18.2	20	.9	1	.9	1	110	30.5	32	60.0	63	6.7	7	2.9	3	105
Air pollution (e.g., smoke, mercury emissions)	22.7	25	36.4	40	27.3	30	2.7	3	10.9	12	110	28.4	29	48.0	49	7.8	8	15.7	16	102
Household sewage and urban water waste	27.5	30	48.6	53	14.7	16	2.8	3	6.4	7	109	42.7	44	41.7	43	6.8	7	8.7	9	103
Agriculture, residential, and forestry effluents	41.4	46	41.4	46	11.7	13	2.7	3	2.7	3	111	50.5	52	41.7	43	3.9	4	3.9	4	103
Garbage and solid waste	10.1	11	45.0	49	32.1	35	4.6	5	8.3	9	109	38.2	39	48.0	49	2.9	3	10.8	11	102
Excess energy (e.g., noise/light pollution, warm water discharge, etc.)	10.9	12	40.0	44	30.9	34	7.3	8	10.9	12	110	29.4	30	54.9	56	0.0	0	15.7	16	102

Other responses listed:

Response text:

N

Insecticides and herbicides used on ag lands

1**Total responses:****1**

Climate Change and Severe Weather

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?									
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses	Increase		Remain the same		Decrease		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	%	N	
Changing frequency, duration, and intensity of drought	51.1	46	38.9	35	8.9	8	1.1	1	0.0	0	90	79.3	65	13.4	11	0.0	0	7.3	6	82
Changing frequency, duration, and intensity of floods	50.6	45	38.2	34	10.1	9	1.1	1	0.0	0	89	81.7	67	11.0	9	0.0	0	7.3	6	82
Shifting and alteration of habitats due to climate change	46.1	41	44.9	40	7.9	7	1.1	1	0.0	0	89	79.3	65	13.4	11	0.0	0	7.3	6	82
Temperature extremes	43.3	39	46.7	42	7.8	7	2.2	2	0.0	0	90	81.7	67	11.0	9	0.0	0	7.3	6	82

Shifting seasons/phenology	34.1	30	50.0	44	10.2	9	2.3	2	3.4	3	88	82.9	68	13.4	11	0.0	0	3.7	3	82
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Other responses listed:

Response text:	N
Multiplier of other threats such as disease and invasives	1
Total responses:	1

Other Stressors

Great Lakes (Region 1)	To what extent is this issue a current threat to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?										How will the significance of this threat change over the next 10 years?											
	Significant threat		Moderate Threat		Minor Threat		Not a threat		I don't know		Total Responses		Increase		Remain the same		Decrease		I don't know		Total Responses	
	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Low genetic diversity (due to reduced population size, species inbreeding, etc.)	27.3	15	40.0	22	14.5	8	7.3	4	10.9	6	55	42.6	23	37.0	20	1.9	1	18.5	10	54		
Diseases	25.0	10	45.0	18	17.5	7	0.0	0	12.5	5	40	57.5	23	27.5	11	0.0	0	15.0	6	40		

Other responses listed:

Response text:	N
CWD and VHS	1
Total responses:	1

16. Please use the box below to indicate other **emerging/anticipated** threats over the next 10 years to fish and wildlife habitats within **HABITAT** in the **Great Lakes (Region 1)** that have not been previously identified. Please provide **specific examples** of the emerging/anticipated threats that you indicate.

Response text:	N
The growing disconnect between people and natural systems inhibits the ability of the public to make informed decisions related to natural resources. More conservation education is needed to increase the public's knowledge, experiences and skills to result in informed decisions, a commitment and constructive actions for wildlife resources.	5
1000 cankers in black walnut a threat. Asian longhorn beetle a threat. Gypsy moth a threat to forests.	1
Altered hydrology in existing wetland will increase drought impacts - current DNR lands should be evaluated to develop strategies that increase resilience to future predicted climate / / Part of the threat is that DNR is not thinking about climate change and implementing resilience strategies now. / / Invasive species will likely increase under future climates - invasives are already a serious problem on many publically held lands and will increase in the future	1
An anticipated threat to grasslands is the inability to manage grasslands with fire due to at least two factors: / 1) smoke management and concerns by the public that smoke is a pollutant / 2) restrictions on seasonality of fires due to increased regulations concerning Endangered, Threatened, and Rare animal species (i.e. Indiana bat in savannas and open oak woodlands, Massassauga Rattlesnakes in wet prairies).	1
Another threat is public perception that "green" alternatives in the commercial and residential landscape (such as "conservation development" in Porter County or green infrastructure) actually benefit wildlife/aquatic life. While these alternatives might do less harm than other alternatives, generally habitat is still fragmented and stormwater runoff still travels over impervious surfaces, warming up the water. In cold water habitats available in the Great Lakes Region (especially in the Lake Michigan drainage), temperature increases are a major issue. Selling the public on these "green practices" is not the same as preserving connected, undisturbed habitat.	1
As a specific example to pollution, pharmaceuticals are an emerging threat. Particularly, those considered to be endocrine disruptors. Certain pesticides fall into this	1

category as well. Treatment plants do not remove them unless equipped with tertiary equipment.	
Asian carp, invasive species from the Mississippi River, etc.	1
Blue Green Algae	1
Climate change, in conjunction with ag drainage systems, will interact to create peak flows that damage headwater streams and increase downstream flood risk. Ironically, this will also decrease ground water recharge, increasing the risk from low flows during prolonged droughts / / Current ag production is creating serious nutrient loading issues to lakes and streams - especially DRP. / / /	1
Contaminants of emerging concern pose a significant threat to fish and wildlife habitats within aquatic systems which may be observed over the next years, but more likely in the coming decades. A multitude of pharmaceutical products, hormones, and agrichemicals are present at low concentrations in great lakes surface waters.	1
CWD and EHD in deer continue to be a threat, particularly in the many deer farms of this region. Invasive plants always a concern. Emerald ash borer and Asian longhorn beetle are threats to certain tree species. Flash flooding and then low flow issues due to ag and urban drainage priorities.	1
Evasive weeds. Native weeds taking over	1
Exotic Species	1
I think most of the threats presently known have been identified. New research may uncover new threats that have not been recognized or become evident through information gained from monitoring our forests over time. The greatest threat is going to continue to be loss of habitat due to increasing human population growth and land use conversions.	1
I wonder about the increase of deep water wells and center pivot irrigation systems and their potential impact on groundwater and groundwater dependent wetlands.	1
Increased awareness of blue-green algae as it continues to be a problem and perceived dangers associated with it. / / Increased concern with effects of wind farms and windmills on wildlife and birds.	1
Increased pollution to the upper Wabash River from Grand Lake St. Marys Ohio. Asian Carp getting past existing barriers in the Great Lakes.	1
Invasive species will continue to expand as a problem	1
Loss of CRP and conversion to farmland is probably the major threat to grasslands in the region, as CRP constitutes the majority of grasslands in this region. Hayfields and other grasslands disturbed by mowing continue to act as ecological traps to nesting grassland wildlife, and hayfields are likely to continue to be more intensively managed in the future. Biofuel plantings (e.g. miscanthus) represents a potential significant impact on existing and future grasslands.	1
manipulation of grassland/wetland habitats to enhance recreational access on DNR lands has increased the introduction and spread of invasive species. Most wet grasslands on DNR holdings are being converted to reed canary grass - with the exception of those managed by DNP.	1
neonicotinoids (however you actually spell it!) and other new biocides are, and will continue to alter basic energy pathways in agricultural and adjacent habitats.	1
One of the biggest threats is not enough public land is being set aside for protection (i.e. state parks, wildlife areas, etc...)	1
Pattern tiling in and around wetlands has the potential to significantly alter the hydrology of existing wetlands and thus the plant communities and habitats within wetlands	1
Plastic pollution, micro-beads, and emerging contaminants	1
Primary threat to wetlands is draining or filling for ag and development purposes. Water quality somewhat an issue. We need a no net loss of wetlands policy.	1
The Asian Carp is an obvious one, not sure was addressed above. Invasive plants continue to spread and new ones introduced. Possibility of fish diseases being introduced.	1
Total Responses:	30

Section IV: Conservation Actions for Fish and Wildlife Habitats

Directions:

When responding to the questions in this section, please think about conservation actions for fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1).

17. Please indicate (1) the importance of the following general categories of conservation actions for fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1) over the next 10 years, and (2) considering your responsibility within your agency/organization, whether you have taken a general category of conservation actions for fish and wildlife habitats within **HABITAT** in the **Great Lakes (Region 1)** since 2005 or have plans to do so.

<i>Great Lakes (Region 1)</i>	To what extent do you think this category of conservation action is important for fish and wildlife habitats within HABITAT in the Great Lakes (Region 1) over the next 10 years?										Have you taken (since 2005) or do you currently plan to take conservation actions in this category for fish and wildlife habitats within HABITAT in the Great Lakes (Region 1)?							
	Very Important		Moderately Important		Somewhat Important		Not Important		I don't know		Total Responses	Yes		No		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N		%	N	%	N	%	N	
Land/water protection	72.4	105	15.9	23	7.6	11	4.1	6	0.0	0	145	64.2	70	23.9	26	11.9	13	109
Land/water/species management	72.5	103	19.7	28	6.3	9	.7	1	.7	1	142	74.5	79	17.9	19	7.5	8	106
Education and awareness	63.6	91	31.5	45	4.2	6	.7	1	0.0	0	143	81.5	88	11.1	12	7.4	8	108
Law and policy	44.1	63	37.1	53	11.9	17	1.4	2	5.6	8	143	30.2	32	49.1	52	20.8	22	106
Livelihood, economic, and other incentives	32.9	47	45.5	65	11.2	16	4.2	6	6.3	9	143	28.3	30	45.3	48	26.4	28	106
External capacity building	37.5	54	31.3	45	22.9	33	2.1	3	6.3	9	144	34.6	37	37.4	40	28.0	30	107

18. You indicated that in your opinion conservation actions relating to the following general categories would be very or moderately important for fish and wildlife habitats within **HABITAT** in the **Great Lakes (Region 1)** over the next 10 years. Please indicate the importance of the following specific conservation actions within these general categories for fish and wildlife habitats within HABITAT in the Great Lakes (Region 1). You may add additional conservation actions you think are important using the “Other, please specify” option. (Check one for each line item)

Land/Water Protection

<i>Great Lakes (Region 1)</i>	Very important		Moderately important		Somewhat important		Not important		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N	
Acquire currently unprotected aquatic systems (manage and/or educate for easement habitat values)	66.7	28	31.0	13	2.4	1	0.0	0	0.0	0	42
Acquire currently unprotected barren lands	100.0	4	0.0	0	0.0	0	0.0	0	0.0	0	4
Acquire currently unprotected forests	84.2	16	10.5	2	5.3	1	0.0	0	0.0	0	19
Acquire currently unprotected grasslands	73.3	11	20.0	3	6.7	1	0.0	0	0.0	0	15
Acquire currently unprotected wetlands	91.3	21	8.7	2	0.0	0	0.0	0	0.0	0	23

Acquire currently unprotected subterranean habitats	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Preserve currently existing corridors	78.7	96	18.0	22	2.5	3	0.0	0	.8	1	122	
Acquire conservation easements to protect important wildlife habitats	74.6	91	19.7	24	5.7	7	0.0	0	0.0	0	122	
Reduce conversion to cropland	62.8	76	23.1	28	7.4	9	3.3	4	3.3	4	121	
Build/strengthen CRP partnerships	52.5	64	35.2	43	6.6	8	.8	1	4.9	6	122	

Other responses listed:

Response text:	N
assist private landowners financially and with management plans	1
Educate private landowners	1
Low water flow	1
Manage current habitats	1
Total responses:	4

Land/Water/Species Management

	<i>Great Lakes (Region 1)</i>		Very important		Moderately important		Somewhat important		Not important		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N			
Control invasive species in agricultural lands	60.0	9	33.3	5	6.7	1	0.0	0	0.0	0	15		
Control invasive species in aquatic systems (e.g., Asian carp, zebra mussels, invasive aquatic plants)	75.6	34	22.2	10	2.2	1	0.0	0	0.0	0	45		
Control invasive species in barren lands	100.0	3	0.0	0	0.0	0	0.0	0	0.0	0	3		
Control invasive species in developed lands	62.5	5	37.5	3	0.0	0	0.0	0	0.0	0	8		
Control invasive species in forests	84.2	16	10.5	2	5.3	1	0.0	0	0.0	0	19		
Control invasive species in grasslands	78.6	11	14.3	2	7.1	1	0.0	0	0.0	0	14		
Control invasive species in wetlands	78.3	18	21.7	5	0.0	0	0.0	0	0.0	0	23		
Control invasive species in subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Control problematic species (e.g., deer, raccoon, geese, domestic cat, feral hog) in agricultural lands	46.7	7	40.0	6	13.3	2	0.0	0	0.0	0	15		
Control problematic native species in aquatic systems	46.7	21	26.7	12	22.2	10	2.2	1	2.2	1	45		
Control problematic species (e.g., deer, raccoon, skunk, coyote, domestic cat, feral hog) in barren lands	0.0	0	100.0	3	0.0	0	0.0	0	0.0	0	3		
Control problematic species (e.g., deer, raccoon, geese, domestic cat, feral hog, exotic/aggressive vegetation) in developed lands	37.5	3	37.5	3	25.0	2	0.0	0	0.0	0	8		
Control problematic species (e.g., deer, raccoon, domestic cat, feral hog) in forests	47.4	9	31.6	6	21.1	4	0.0	0	0.0	0	19		
Control problematic species (e.g., raccoon, skunk, coyote, domestic cat) in grasslands	6.7	1	26.7	4	40.0	6	20.0	3	6.7	1	15		
Control problematic species (e.g., deer, raccoon, domestic cat, feral hog, exotic/aggressive vegetation) in wetlands	26.1	6	26.1	6	30.4	7	4.3	1	13.0	3	23		
Control problematic native species in subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Dam removal	23.9	16	28.4	19	29.9	20	11.9	8	6.0	4	67		

Decrease E. coli counts	39.1	25	25.0	16	26.6	17	7.8	5	1.6	1	64
Decrease number of combined sewer overflow events	51.5	35	26.5	18	19.1	13	2.9	2	0.0	0	68
Develop and promote farming technologies and practices that have conservation benefits (e.g., cover crops, no till)	62.5	80	25.8	33	8.6	11	2.3	3	0.8	1	128
Ex situ conservation (protection of a species outside of its natural habitat). Please specify:	7.8	9	16.5	19	13.9	16	25.2	29	36.5	42	115
Improve drainage management	56.8	71	23.2	29	10.4	13	5.6	7	4.0	5	125
Improve integrated pest management	33.3	5	40.0	6	26.7	4	0.0	0	0.0	0	15
Increase acres of riparian buffers	60.6	77	26.8	34	9.4	12	2.4	3	0.8	1	127
Increase acres enrolled in the Classified Forest and Wildlands Program	35.4	45	28.3	36	22.0	28	7.9	10	6.3	8	127
Link existing habitat blocks through corridor enhancement in agricultural lands	73.3	11	26.7	4	0.0	0	0.0	0	0.0	0	15
Link existing habitat blocks through corridor enhancement in aquatic systems	45.5	20	31.8	14	15.9	7	2.3	1	4.5	2	44
Link existing habitat blocks through corridor enhancement in barren lands	33.3	1	66.7	2	0.0	0	0.0	0	0.0	0	3
Link existing habitat blocks through corridor enhancement in developed lands	75.0	6	12.5	1	12.5	1	0.0	0	0.0	0	8
Link existing habitat blocks through corridor enhancement in forests	84.2	16	5.3	1	10.5	2	0.0	0	0.0	0	19
Link existing habitat blocks through corridor enhancement in grasslands	73.3	11	6.7	1	13.3	2	6.7	1	0.0	0	15
Link existing habitat blocks through corridor enhancement in wetlands	47.8	11	34.8	8	13.0	3	4.3	1	0.0	0	23
Enhance corridors in subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manage biofuel grasslands	16.7	5	23.3	7	26.7	8	10.0	3	23.3	7	30
Manage urban woodlots	37.5	3	62.5	5	0.0	0	0.0	0	0.0	0	8
Mine reclamation	9.5	10	6.7	7	10.5	11	42.9	45	30.5	32	105
Promote diversity of forest types and successional stages	63.2	12	15.8	3	21.1	4	0.0	0	0.0	0	19
Promote diversity of grassland types and successional stages	46.7	7	33.3	5	20.0	3	0.0	0	0.0	0	15
Promote diversity of wetland types and successional stages	60.9	14	30.4	7	8.7	2	0.0	0	0.0	0	23
Protect and enhance undeveloped shorelines	70.6	48	25.0	17	4.4	3	0.0	0	0.0	0	68
Protect natural water regimes (e.g., withdraws, warm-water discharge)	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0
Protect adjacent buffer zones	68.6	48	27.1	19	4.3	3	0.0	0	0.0	0	70
Reduce losses of fish and wildlife habitats (due to agriculture, urban sprawl, commercial development, etc.)	85.0	108	9.4	12	3.1	4	1.6	2	0.8	1	127
Reduce nutrient and toxin loads (e.g., heavy metals, pharmaceuticals, fertilizers, insecticides)	65.6	82	23.2	29	8.0	10	2.4	3	0.8	1	125
Reduce recreational overuse of aquatic systems	22.7	10	36.4	16	29.5	13	11.4	5	0.0	0	44
Reduce recreational overuse of forests	0.0	0	38.9	7	55.6	10	0.0	0	5.6	1	18
Reduce recreational overuse of grasslands	13.3	2	33.3	5	20.0	3	26.7	4	6.7	1	15
Reduce recreational overuse of wetlands	26.1	6	26.1	6	26.1	6	17.4	4	4.3	1	23
Reduce recreational overuse of subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reduce stream bank erosion	64.4	29	24.4	11	8.9	4	0.0	0	2.2	1	45
Reduce stream head cutting	40.9	18	36.4	16	13.6	6	0.0	0	9.1	4	44
Reestablish natural disturbance regimes in barren lands	100.0	3	0.0	0	0.0	0	0.0	0	0.0	0	3
Reestablish natural disturbance regimes in forests	57.9	11	26.3	5	10.5	2	0.0	0	5.3	1	19

Reestablish natural disturbance regimes in grasslands	53.3	8	33.3	5	6.7	1	6.7	1	0.0	0	15
Reestablish natural disturbance regimes in wetlands	43.5	10	39.1	9	13.0	3	0.0	0	4.3	1	23
Reestablish natural disturbance regimes in subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Remove log jams	7.0	3	23.3	10	27.9	12	32.6	14	9.3	4	43
Restore and integrate diversity of habitats into crop-production dominated landscapes	80.0	12	20.0	3	0.0	0	0.0	0	0.0	0	15
Restore and integrate diversity of habitats into developed landscapes	75.0	6	12.5	1	12.5	1	0.0	0	0.0	0	8
Restore habitats and natural systems in aquatic systems	71.1	32	17.8	8	6.7	3	4.4	2	0.0	0	45
Restore habitats and natural systems in barren lands	100.0	3	0.0	0	0.0	0	0.0	0	0.0	0	3
Restore habitats and natural systems in forests	78.9	15	15.8	3	5.3	1	0.0	0	0.0	0	19
Restore habitats and natural systems in grasslands	73.3	11	20.0	3	6.7	1	0.0	0	0.0	0	15
Restore habitats and natural systems in wetlands	87.0	20	13.0	3	0.0	0	0.0	0	0.0	0	23
Restore habitats and natural systems in subterranean systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Species reintroduction. Please specify:	17.5	7	12.5	5	5.0	2	20.0	8	45.0	18	40

Ex situ conservation

Response text	N
Pheasant	3
Asian Carp	2
amphibians (northern leopard frog, cricket frog, salamanders) and reptiles (spotted turtle, Blandings turtle)	1
Deer Farming	1
dont like this -- too expensive and not reliable	1
for endangered spp, this might be their only hope (e.g. eastern massassagua, spotted turtle, copperbelly water snake), but doubt it would work for all endangered species	1
Karner blue butterfly	1
Salmon/trout	1
trout waters	1
Total responses:	12

Species reintroduction listed by respondents:

Response text:	N
improve status of T/E spp	2
avians (bitterns, night heron)	1
bison	1
Cisco, northern pike	1
copperbelly snakes	1
Copperbelly water snake, mitchell's satyr, etc	1
enhance T/E spp, mussels, hellbenders, etc.	1
extirpated aquatic species	1
northern pike	1
Total Responses:	10

Other responses listed:

Response text:	N
Plan for shifts in species range due to climate change.	1
Total Responses:	1

Education and Awareness

	<i>Great Lakes (Region 1)</i>		Very important		Moderately important		Somewhat important		Not important		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N			
Educational programs in general	57.1	76	34.6	46	7.5	10	0.0	0	.8	1		133	
Educational programs specifically for K-12	38.3	51	45.1	60	15.0	20	0.0	0	1.5	2		133	
Improvement of signage and other communication materials in conservation areas	31.1	41	35.6	47	29.5	39	1.5	2	2.3	3		132	
Training programs for stakeholders	31.3	40	41.4	53	21.1	27	3.1	4	3.1	4		128	

Other responses listed:

Response text:	N
broad public education - "smoky bear" levels so that awareness is raised on a societal level, not just among those already "linked-in"	1
broadscale, "Smoky Bear" type education might be somewhat effective. Training programs often preach to the choir, awareness might be the key instead.	1
get public to value fish and wildlife resources	1
get public to value resources	1
get public to value wetland resources	1
opportunities for interested stakeholders to participate in stewardship actions as examples of what they can do on their own property	1
Programs on ecological importance of natural lake level fluctuations	1
skills training for stakeholders	1
WE need statewide education on these habitats. A loss of 85% in the state and counting is not acceptable! The current in-lieu fee program may have the opportunity to build significant wetlands, but we need to stop destroying what we have. Only through education...	1
Total responses:	9

Law and Policy

	<i>Great Lakes (Region 1)</i>		Very important		Moderately important		Somewhat important		Not important		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N			
Increase regulations on invasive species	54.4	62	36.0	41	6.1	7	1.8	2	1.8	2		114	
Change current laws, policies, and regulations. Please specify:	35.9	37	21.4	22	8.7	9	2.9	3	31.1	32		103	
Set private sector standards and codes	27.7	31	38.4	43	19.6	22	2.7	3	11.6	13		112	
Improve compliance with and enforcement of current policies	49.1	55	43.8	49	5.4	6	0.0	0	1.8	2		112	
Reduce urban sprawl through planning and zoning	51.8	58	33.0	37	10.7	12	.9	1	3.6	4		112	
Establish legal lake levels	29.7	11	16.2	6	35.1	13	10.8	4	8.1	3		37	
Establish rules and guidelines for piers and other structures	29.7	11	29.7	11	40.5	15	0.0	0	0.0	0		37	

Increase compliance of existing rules and regulations for aquatic systems	71.1	27	15.8	6	13.2	5	0.0	0	0.0	0	38
Establish submergent vegetation control guidelines	42.1	16	34.2	13	15.8	6	2.6	1	5.3	2	38
Change current laws, policites, and regulations responses:											
Response text											N
Farm run off											2
drainage code											1
Add invasive species to noxious weeds list and ban the sale of them.											1
ag drainage laws must balance environmental damage against ag benefits											1
alter existing law on sale of invasive species											1
alter existing laws regarding the sale of invasive species											1
Ballast water regs											1
Boat Cleaning											1
Buffers to protect quality of habitats											1
change drainage laws such that ag drains balance environmental damage against ag benefits											1
Do a better job of enforcing what we have											1
Drainage boards can do what they want with legal drains											1
Eliminate phosphorus from fertilizers and household and industrial products. Stricter management of CAFO waste disposal.											1
eliminate sales of non-native invasive species											1
enact law to fund conservation											1
enact laws that provide additional funding for conservation											1
enact laws to improve funding of wetland conservation/mgmt											1
enforcement is more important than change											1
Farm Run off											1
improve local drainage laws, consider Wisconsin style riparian buffer rules.											1
Low impact development - enforcement for riparian corridors and											1
make non-native invasives illegal to sell											1
not that it will happen, but agricultural needs to be regulated; aquatic habitat destruction needs to be regulated (ie., logjam and woody debris removal)											1
Protect buffers											1
require sterilization of ballast water											1
restrict to prevent over harvest											1
The policy to essentially rubber-stamp wetland permits needs to stop.											1
To many native weeds											1
treat ballast water											1
use of natural lakes											1
Wetland drainage (and other hydromodifications) essentially gets a rubber stamp in the permitting world. This needs to stop! We destroy more habitats in the name of progress than is conscienable and then complain when we do not receive the ecological services (i.e. flood control) from the habitats we destroyed.											1
Total responses											32
Other responses listed:											
Response text											N
Total responses:											0

Livelihood, Economic, and Other Incentives

Great Lakes (Region 1)

	Very important		Moderately important		Somewhat important		Not important		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N	
Link natural resources to livelihoods through nature tourism	31.8	35	47.3	52	17.3	19	3.6	4	0.0	0	110
Support substitution of alternatives for environmentally harmful products and processes	32.1	35	46.8	51	11.9	13	1.8	2	7.3	8	109
Promote market forces (e.g., creation of a nitrogen trading market, promotion of alternative agricultural markets) as a tool for conservation	20.2	22	33.0	36	25.7	28	4.6	5	16.5	18	109
Promote conservation payment programs (e.g., payment for ecosystem services, conservation easements)	32.4	35	46.3	50	15.7	17	1.9	2	3.7	4	108
Promote nonmonetary values of natural systems within the state	43.5	47	41.7	45	13.9	15	.9	1	0.0	0	108
Manage recreational opportunities to be compatible with fish and wildlife habitats	54.1	59	33.9	37	10.1	11	0.0	0	1.8	2	109

Other responses listed:

Response text	N
carbon sequestration credit	1
promote green businesses that benefit from greenspace and habitat	1
stormwater fee credits	1
Total responses:	3

External Capacity Building

Great Lakes (Region 1)

	Very important		Moderately important		Somewhat important		Not important		I don't know		Total Responses
	%	N	%	N	%	N	%	N	%	N	
Develop institutions and civil society	23.2	22	31.6	30	17.9	17	4.2	4	23.2	22	95
Develop alliances and partnerships (e.g., between producers, landowners, and conservation professionals)	60.0	57	32.6	31	5.3	5	0.0	0	2.1	2	95
Strengthen conservation financing	61.1	58	29.5	28	6.3	6	0.0	0	3.2	3	95
Increase state's capacity for research and monitoring of conservation actions	50.0	47	41.5	39	8.5	8	0.0	0	0.0	0	94
Promote green infrastructure	46.9	45	38.5	37	8.3	8	1.0	1	5.2	5	96
Promote use of research and science in conservation decision-making processes	73.2	71	22.7	22	4.1	4	0.0	0	0.0	0	97

Other responses listed:

Response text	N
improve communications with stakeholders/partners	1
Total responses:	1