

AGRICULTURAL HABITATS NARRATIVE

Habitat Description

Agricultural land habitats include row crops, cereal grains, vineyards, feedlots, residue management, confined livestock operations and orchards.

Problems affecting species and habitats

Species threats

Respondents ranked the top threats to wildlife in agricultural habitats in Indiana:

Rank	Threats to wildlife in agricultural habitats
1	Habitat loss (breeding range)
2	Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)
3	Habitat loss (feeding/foraging areas)
4 (tie)	Predators (native or domesticated)
4 (tie)	Invasive/non-native species
5	Bioaccumulation of contaminants
6 (tie)	Small native range (high endemism)
6 (tie)	Near limits of natural geographic range
7 (tie)	High sensitivity to pollution
7 (tie)	Dependence on other species (mutualism, pollinators)
8 (tie)	Unintentional take/direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)
8 (tie)	Genetic pollution (hybridization)

A respondent listed additional threats to wildlife in agricultural habitats in Indiana:
Sporadic occurrence of early and mid successional fields is the greatest deterrent to higher abundance

Respondents listed top threats to wildlife in agricultural habitats in Indiana (not ranked):
Loss of ephemeral and semi-permanent wetlands
Lack and distance apart of available patches of habitat. These habitats are ephemeral

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to wildlife in agricultural habitats. Their responses included:

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- Yes, if lack of early/mid successional habitat is included. Also, under Habitat description: "residue management" is not a habitat type, it is a management strategy used on row crops.
- Yes

Habitat threats

Respondents ranked the top threats to agricultural habitats in Indiana:

Rank	Threats to agricultural habitats
1	Habitat fragmentation
2	Habitat degradation
3	Commercial or residential development (sprawl)
4	Agricultural/forestry practices
5	Successional change
6 (tie)	Mining/acidification
6 (tie)	Drainage practices (stormwater runoff)
6 (tie)	Invasive/non-native species
7 (tie)	Counterproductive financial incentives or regulations
7 (tie)	Point source pollution (continuing)
8 (tie)	Nonpoint source pollution (sedimentation and nutrients)
8 (tie)	Residual contamination (persistent toxins)

Respondents did not offer additional threats to agricultural habitats in Indiana.

Respondents listed top threats to agricultural habitats in Indiana (not ranked):

Habitat loss and degradation

Farming practices and succession (Suitable land is ephemeral and spread out)

Ephemeral wetland loss and fragmentation

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to agricultural habitats. Their responses included:

- Yes
- Agricultural practices should be ranked as No.1 threat to agricultural habitats due to incessant efforts to tile and drain more land and clear out all odd areas or adjacent wildlife habitat such as fencerows.

Additional research and survey efforts

Current body of research

Species research

Two-thirds of respondents indicated that the current body of research is adequate for wildlife in agricultural habitats in Indiana. One-third indicated that species research is inadequate.

Respondents identified the following citations (title, author, date, publisher) that would give the best overview of wildlife in agricultural habitats in Indiana.

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 = Multivariate analyses of the influences of water chemistry and habitat parameters on the abundances of pond-breeding amphibians;
Author = Robert Brodman et al;
Date = 2003;
Publisher = Journal of Freshwater Ecology 18: 425-436.

Title = The Status of Amphibians in Rural Northwest Indiana;
Author = Brodman, R., and M. Kilmurry;
Date = 1998;
Publisher = Iowa University Press, Iowa City, Iowa

Title = Distribution of the western harvest mouse in Indiana;
Author = Leibacher and Whitaker;
Date = 1998;
Publisher = Ind, Acad. Sci. 107:167-170

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the current body of science for wildlife in agricultural habitats. Their responses included:

- Sadly, it might be.
- No, this is inadequate list of research on wildlife use of ag land.

Habitat research

All respondents stated that the current body of science for agricultural habitats in Indiana is inadequate.

Respondents did not identify citations (title, author, date, publisher) that would give the best overview of Agricultural habitats in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the current body of science for agricultural habitats. Their responses included:

- Yes

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- The above list has to be inadequate just from the standpoint of research on contaminants such as chemical herbicides, soil erosion and livestock runoff.

Research needs

Species research

Respondents ranked research needs for wildlife in agricultural habitats in Indiana:

Rank	Research needs for wildlife in agricultural habitats
1	Threats (predators/competition, contamination)
2	Population health (genetic and physical)
3 (tie)	Limiting factors (food, shelter, water, breeding sites)
3 (tie)	Relationship/dependence on specific habitats
4	Distribution and abundance
5	Life cycle

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for wildlife in agricultural habitats. Their responses included:

- Yes
- Need more research identifying impacts to wildlife related to creation of large, featureless fields with ditched and straightened creeks. Need research to show impacts to nesting birds, small game and reptiles/amphibians related to the timing of tillage practices and technique such as mechanical vs chemical preparation.

Habitat research

Respondents ranked research needs for agricultural habitats in Indiana:

Rank	Research needs for agricultural habitats
1 (tie)	Threats (land use change/competition, contamination/global warming)
1 (tie)	Relationship/dependence on specific site conditions
2	Successional changes

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3	Distribution and abundance (fragmentation)
4	Growth and development of individual components of habitat

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for agricultural habitats. Their responses included:

- Yes, including Distribution and dispersal factors with regard to habitat factors including streams [and] larger rivers
- Yes

A respondent specified research needed about agricultural habitats in Indiana:

Distribution and dispersal factors with regard to habitat factors including streams [and] larger rivers

Conservation actions necessary

Species actions

Of existing conservation efforts to address threats to wildlife in agricultural habitats in Indiana, two-thirds of respondents ranked "habitat protection" as the top method. One-third of respondents ranked "exotic/invasive species control" as "somewhat" effective. Respondents generally stated that other listed efforts did not address threats, were not used, or they were not aware of their use or impact.

Respondents listed no other current conservation practices for wildlife in agricultural habitats in Indiana.

Respondents recommended the following for more effective conservation of wildlife in agricultural habitats in Indiana (not ranked):

Protection of fishless, breeding habitat and wetland restoration

Manage succession so that proper habitat was more abundant and closer together

Protection of ephemeral wetlands and control of purple loosestrife

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the conservation of wildlife in agricultural habitats.

Their responses included:

- Yes, including Protection of fishless, breeding habitat and wetland restoration
 - Manage succession so that proper habitat was more abundant and closer together
 - Protection of ephemeral wetlands
- No, increase of filter strips and maintenance of non-tilled riparian habitat strips for fixed widths along every stream drainage should become mandatory. Ditching and straightening of streams should be prohibited and channel sinuosity restored through farm subsidy requirements.

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Habitat actions

Respondents ranked conservation efforts that address threats to agricultural habitats best:

Rank	Conservation efforts for agricultural habitats
1 (tie)	Habitat protection through regulation
1 (tie)	Habitat protection on public lands
1 (tie)	Habitat restoration on public lands
2 (tie)	Habitat protection incentives (financial)
2 (tie)	Habitat restoration incentives (financial)
2 (tie)	Artificial habitat creation (artificial reefs, nesting platforms)
2 (tie)	Cooperative land management agreements (conservation easements)
2 (tie)	Habitat restoration through regulation

Respondents listed no other current conservation practices for agricultural habitats in Indiana.

Respondents recommended these practices for more effective conservation of agricultural habitats in Indiana (not ranked):

Habitat protection and restoration
Ephemeral wetland protection and restoration

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the conservation of agricultural habitats. Their responses included:

- No, I don't agree with the ranking or that protection/restoration on public land will solve agricultural habitat problems.
- Education ("making the case") is an overarching component of habitat protection, particularly when it involves regulation or public purchase.
- Habitat restoration through financial incentives is the only way any ag habitat is going to be restored.

Partner agencies/organizations

The following organizations indicated that they work in Agricultural habitats.

Organization	Percent of time spent in Agricultural

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	habitats
ACRES, Inc.	15
American Consulting, Inc.	5
American Society of Landscape Architects, Indiana Chapter	
Arrow Head Country Resource Conservation & Development Area, Inc.	10
Big Oaks National Wildlife Refuge, USFWS	5
Cinergy Corp.	5
Clark's Valley Land Trust	50
Division of Fish and Wildlife	28
Federal Highway Administration (FHWA)	?
fish lake conservancy district	5
Fur Takers of America	
fur takers of america chapter 7-E north west in.	?
Great Lakes Commission	NA
Hoosier Environmental Council	10
Hoosier Heartland Resource Conservation and Education council	10
IDNR- Division of Forestry- Cooperative Forest Management Section (Private Lands)	15
IN DNR, Division of State Parks & Reservoirs, Interpretive Services	~5
Indiana Beaglers Alliance	10
Indiana Beef Cattle Association	
Indiana Chamber of Commerce	15
Indiana Department of Natural Resources Division of Forestry, Properties Section (State Forests)	1
Indiana Division of the Izaak Walton League of America	1
Indiana Environmental Institute	10
Indiana Land Resources Council	
Indiana Pork Producers Association	100
Indiana Quail Unlimited	45
Indiana Soybean Board (ISB) & Indiana Soybean Growers Association (ISGA)	100
Indiana state trappers assoc	40
Kankakee River Basin Commission	
Lake Maxinkuckee Environmental Council (LMEC)	5
Lincoln Hills RC&D	30
Lost River Conservation Association	7
Mason & Hanger Corp. Newport Chemical Depot	50
Merry Lea Environmental Learning Center of Goshen College	1
National Wild Turkey Federation	30
Pheasants Forever Inc.	40
Robert Cooper Audubon Society	5
Sierra Club Hoosier Chapter	15
St. Joseph County Soil & Water Conservation District (SWCD)	70
St. Joseph River Watershed Initiative	35

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Sycamore Land Trust	10
The Nature Conservancy	10
US Fish and Wildlife Service Ecological Services (does not include national wildlife refuges)	10
USDA Natural Resources Conservation Service	
Veolia Water Indianapolis, LLC	10
Wabash River Heritage Corridor Commission	10

Proposed plans for monitoring Current monitoring

Species monitoring

One-third of respondents were aware of the following monitoring effort by state agencies for wildlife in agricultural habitats in Indiana:
Statewide once-a-year monitoring

Respondents indicated awareness of monitoring efforts conducted by other organizations for wildlife in agricultural habitats in Indiana (not ranked):

- Occasional regional or local (less than once a year and not regularly scheduled) monitoring
- Regional or local year-round monitoring
- Periodic regional or local (less than once a year but still regularly scheduled) monitoring

One-third of respondents ranked “statewide once-a-year monitoring” by state agencies as “very crucial” to wildlife conservation in agricultural habitats in Indiana.

Respondents ranked the importance of monitoring efforts by other organizations for wildlife conservation in agricultural habitat in Indiana:

Rank	Monitoring by other organizations for wildlife in agricultural habitats
1	Regional or local once-a-year monitoring
2 (tie)	Periodic regional or local (less than once a year but still regularly scheduled)
2 (tie)	Occasional regional or local (less than once a year and not regularly scheduled)

A respondent listed Indiana DNR’s NAAMP frog call program as a method of regional or local monitoring by state agencies for wildlife in agricultural habitats in Indiana.

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Respondents listed the following regional or local monitoring by other organizations for wildlife in agricultural habitats in Indiana (not ranked):

Robert Brodman, St. Joseph's College
 Monitored twice, 1975 by Ford, and 1998 by Leibacher and Whitaker
 Chicago Wilderness

Respondents cited the following organizations that monitor wildlife in agricultural habitats in Indiana (not ranked):

Indiana State University
 Robert Brodman, St. Joseph's College

The following table reflects the opinions of multiple respondents, thus multiple check marks are possible. Additionally, some of these differences may reflect different taxonomic group bias.

Respondents considered current monitoring techniques for wildlife in agricultural habitats in Indiana as follows:

Monitoring techniques for wildlife in agricultural habitats	Used	Not used but possible with existing technology or data	Not economically feasible
Professional survey/census	X	X	
Volunteer survey/census	X	X	
Driving a survey route	X		
Modeling		X	
Trapping (by any technique)	X		
Representative sites	X		
Probabilistic sites	X		
Mark and recapture		X	
Radio tracking and telemetry		X	
Coverboard routes	X		

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for wildlife in agricultural habitats. Their responses included:

- Don't know

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- Monitoring with infrared cameras for nighttime surveillance of wildlife using cropfields and stream pathways and thermographic imagers for locating nesting birds in pasture, haylands and grasslands.

Respondents cited no other monitoring techniques for wildlife in agricultural habitats in Indiana.

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Habitat inventory and assessment

Respondents were aware of these inventory and assessment efforts of agricultural habitats in Indiana by state agencies (not ranked):

- Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment
- Statewide annual inventory and assessment
- Statewide once-a-year inventory and assessment
- Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
- Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment
- Regional or local year-round inventory and assessment
- Regional or local once-a-year inventory and assessment
- Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment

Respondents were aware of the following inventory and assessment of agricultural habitats in Indiana by other organizations (not ranked):

- Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment
- Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment
- Regional or local year-round inventory and assessment
- Regional or local once-a-year inventory and assessment

Respondents ranked the importance of these inventory and assessment efforts by state agencies for conservation of agricultural habitats in Indiana:

Rank	Inventory and assessment efforts by state agencies for agricultural habitats
1	Statewide annual inventory and assessment
2 (tie)	Statewide once-a-year inventory and assessment
2 (tie)	Regional or local year-round inventory and assessment
2 (tie)	Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment
3 (tie)	Periodic statewide (less than once a year and still regularly scheduled) inventory and assessment
3 (tie)	Occasional statewide (less than once a year and still regularly scheduled) inventory and assessment
3 (tie)	Regional or local once-a-year inventory and assessment

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3 (tie)	Periodic regional or local (less than once a year and still regularly scheduled) inventory and assessment
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Respondents ranked the importance of these inventory and assessment efforts by other organizations for conservation of agricultural habitats in Indiana:

Rank	Inventory and assessment efforts by other organizations for habitats
1 (tie)	Periodic regional or local (less than once a year and still regularly scheduled) inventory and assessment
1 (tie)	Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment
2 (tie)	Statewide once-a-year inventory and assessment
2 (tie)	Regional or local year-round inventory and assessment
3 (tie)	Periodic statewide (less than once a year and still regularly scheduled) inventory and assessment
3 (tie)	Occasional statewide (less than once a year and still regularly scheduled) inventory and assessment
3 (tie)	Regional or local once-a-year inventory and assessment

A respondent listed the following regional or local inventory and assessment of agricultural habitats in Indiana by state agencies:

Frog call surveys include rural and agricultural areas throughout the state

A respondent listed the following organizations that conduct regional or local inventory and assessment of agricultural habitats in Indiana (not ranked):

Robert Brodman, northwest Indiana, St. Joseph's College
Chicago Wilderness and St. Joseph's College have frog call monitoring programs in northwest Indiana.

A respondent listed the following organizations that monitor agricultural habitats in Indiana (not ranked):

ISU; 1975 and 1995 by Ford
1998 by Leibacher and Whitaker

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The following table reflects the opinions of multiple respondents, thus multiple check marks are possible. Additionally, some of these differences may reflect different taxonomic group bias.

Respondents ranked current inventory and assessment techniques for agricultural habitats in Indiana as follows:

Inventory and assessment techniques for agricultural habitats	Used	Not used but possible with existing technology or data	Not economically feasible
GIS mapping		X	
Aerial photography and analysis	X	X	
Systematic sampling	X		
Modeling		X	

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the current inventory and assessment techniques for agricultural habitats. Their responses included:

- Don't know
- Yes

Recommended monitoring

Species monitoring

Respondents recommended the following monitoring techniques for effective conservation of wildlife in agricultural habitats in Indiana (not ranked):

Aquatic surveys for eggs and larva; trapping during breeding migration

Trap periphery of known range in Indiana

Frog call and tadpole surveys

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for effective conservation of wildlife in agricultural habitats. Their responses included:

- No, it needs to include many more agricultural habitat species, especially birds, bats, and native pollinators.
- No, need to make more use of infrared cameras and thermographic imagers to verify presence and use of ag lands by wildlife.

Habitat inventory and assessment

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Respondents recommended the following inventory and assessment techniques for effective conservation of agricultural habitats in Indiana (not ranked):

Systematic sampling and GIS

Same as currently used

Frog call surveys that include rural and agricultural areas throughout the state

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the inventory and assessment techniques for effective conservation of agricultural habitats. Their responses included:

- Unsure
- May want to consider monitoring particular types of threats such as development. Some of this will be useful across habitats and for non-habitat analysis.
- Aerial photography to monitor changes in habitat acres should be included as a standard inventory and assessment technique.

Technical experts and conservation organizations offered the following additional comments:

- USDA Natural Resources Conservation Service percent of time spent in Agricultural habitats = 85%
- You could add the Indiana Land Use Consortium as an organization that works on this habitat. It is a component of the work and discussions we have about agriculture and land use more generally. It would be appropriate to say we work on it 5%.
- Patoka River NWR manages agricultural habitat through cooperative farming agreements on refuge lands and restores prior converted wetlands to palustrine forested habitat on acquired refuge lands. The refuge also partners with the NRCS in reviewing lands nominated by farmers for inclusion in the WRP easement program. The refuge also restores wetland and forested habitat on private agricultural lands through the Fish and Wildlife Services Private Lands Program.