

RIVERS AND STREAMS HABITAT NARRATIVE

Habitat description

This broad habitat type is characterized by flowing water of various width, depth and discharge volume.

Problems affecting species and habitats

Species threats

Respondents ranked the following threats to wildlife in rivers and streams habitat in Indiana:

Rank	Threats to wildlife in rivers and streams habitat
1 (tie)	Habitat loss (breeding range)
1 (tie)	Habitat loss (feeding/foraging areas)
2	Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)
3	Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)
4 (tie)	High sensitivity to pollution
4 (tie)	Bioaccumulation of contaminants
5 (tie)	Predators (native or domesticated)
5 (tie)	Invasive/non-native species
5 (tie)	Specialized reproductive behavior or low reproductive rates
6 (tie)	Small native range (high endemism)
6 (tie)	Large home range requirements
7 (tie)	Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)
7 (tie)	Dependence on other species (mutualism, pollinators)
7 (tie)	Diseases/parasites (of the species itself)
7 (tie)	Regulated hunting/fishing pressure (too much)

Respondents offered no additional threats to wildlife in rivers and streams habitat in Indiana.

Respondents listed top threats to wildlife in rivers and streams habitat in Indiana (not ranked):

- Habitat loss
 - Loss of large nesting trees
 - Loss of high quality nesting and brood rearing habitat
- Degradation of movement/migration routes

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- Mink: 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 mink conservation. This concern applies across the landscape, not just in urban and suburban environments.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to wildlife in rivers and streams habitats. There were no responses.

Habitat threats

Respondents ranked threats to rivers and streams habitat in Indiana:

Rank	Threats to rivers and streams habitat
1	Stream channelization
2	Commercial or residential development (sprawl)
3	Habitat degradation
4 (tie)	Impoundment of water/flow regulation
4 (tie)	Agricultural/forestry practices
5	Drainage practices (stormwater runoff)
6	Habitat fragmentation
7	Counterproductive financial incentives or regulations
8	Successional change
9	Nonpoint source pollution (sedimentation and nutrients)
10 (tie)	Residual contamination (persistent toxins)
10 (tie)	Point source pollution (continuing)
11	Invasive/non-native species
12	Climate change

Respondents noted no other habitat threats to rivers and streams habitat in Indiana.

Respondents listed top threats to rivers and streams habitat in Indiana (not ranked):

- Stream channelization
 - Moves nesting sites and destroys brood habitat
 - Removes or changes vegetative and invertebrate communities
 - Alters water flow which results in a much degraded habitat
- Soil run-off
 - Due to urban development and agricultural practices
- Loss of bottomland hardwoods
 - Provides high quality food source and nesting habitat for wood ducks
- Drainage practices

A respondent made additional comments: "The participant is forced to speculate about the meaning of successional and climate change. Agriculture/Forestry practices have different effects.

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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.”

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to rivers and streams habitat. There were no responses.

Additional research and survey efforts

Current body of research

Species research

One third of respondents stated that the current body of science for wildlife in rivers and streams habitat in Indiana is complete, up-to-date and extensive; one third stated that the current body of science is nonexistent.

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

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

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

I'm am not aware of any literature on mink focused strictly to rivers and streams.

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 rivers and streams habitat. There were no responses.

Habitat research

One third of respondents stated that the current body of science for rivers and streams habitat in Indiana is nonexistent. Two-thirds stated that that “The body of science is better than adequate, it is quite extensive and up to date, but by no means, is it complete.”

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

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

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

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I am not aware of any literature on mink focused strictly to rivers and streams.

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 rivers and streams habitat. There were no responses.

Research needs

Species research

Respondents ranked research needs for wildlife in rivers and streams habitat in Indiana:

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

A respondent noted additional research needs for wildlife in rivers and streams habitat in Indiana:

- Research needs are not limited to river and stream habitats

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 rivers and streams habitat. There were no responses.

Habitat research

Respondents ranked research needs for rivers and streams habitat in Indiana:

Rank	Research needs for rivers and streams habitat
1	Threats (land use change/competition, contamination/global warming)
2	Successional changes
2	Distribution and abundance (fragmentation)
3	Growth and development of individual components of the habitat
4	Relationship/dependence on specific site

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conditions

A respondent noted additional research needs for rivers and streams habitat in Indiana:

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

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for rivers and streams habitat. There were no responses.

Conservation actions necessary

Species actions

Respondents ranked conservation efforts by how well they address threats to wildlife in rivers and streams habitat in Indiana:

Rank	Conservation efforts for wildlife in rivers and streams habitat
1 (tie)	Habitat protection (use below for details)
1 (tie)	Regulation of collecting
2	Population management (hunting, trapping)
3	Protection of migration routes
4 (tie)	Food plots
4 (tie)	Limiting contact with pollutants/contaminants
4 (tie)	Public education to reduce human disturbance
4 (tie)	Exotic/invasive species control
4 (tie)	Threats reduction
4 (tie)	Native predator control

Respondents noted no other current conservation practices for wildlife in rivers and streams habitat in Indiana.

Respondents recommended these practices for more effective conservation of wildlife in rivers and streams habitat in Indiana (not ranked):

- To best benefit the wood duck, one must first improve the habitat
- Habitat protection
- Nest boxes
- Although not habitat specific, outreach programs are needed to effectively and accurately educate citizens about wildlife (game and nongame), the wildlife conservation model (for game and nongame), and the need for effective mink management programs

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the practices for more effective conservation of wildlife in rivers and streams habitat. There were no responses.

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Habitat actions

Respondents ranked conservation efforts by how well they address threats to rivers and streams habitat in Indiana:

Rank	Conservation efforts for rivers and streams habitat
1	Habitat restoration through regulation
2 (tie)	Habitat restoration on public lands
2 (tie)	Habitat restoration incentives (financial)
3 (tie)	Habitat protection on public lands
3 (tie)	Habitat protection incentives (financial)
3 (tie)	Protection of adjacent buffer zone
3 (tie)	Land use planning
4 (tie)	Cooperative land management agreements (conservation easements)
5 (tie)	Artificial habitat creation (artificial reefs, nesting platforms)
5 (tie)	Habitat protection through regulation
5 (tie)	Corridor development/protection
5 (tie)	Managing water regimes
6 (tie)	Pollution reduction
6 (tie)	Restrict public access and disturbance
6 (tie)	Technical assistance
6 (tie)	Succession control (fire, mowing)
6 (tie)	Selective use of functionally equivalent exotic species in place of extirpated natives

Respondents listed no other current habitat conservation practices for rivers and streams habitat in Indiana.

Respondents recommended the following conservation practices for rivers and streams habitat in Indiana (not ranked):

- Elimination or reduction of stream channelization
- Restoration of bottomland hardwoods through the Farm Bill and other incentive programs

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the conservation practices for rivers and streams habitat. There were no responses.

Proposed plans for monitoring

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Current monitoring

Species monitoring

Respondents were aware of the following monitoring efforts by state agencies for wildlife in rivers and streams habitat in Indiana (not ranked):

- Statewide year-round monitoring
- Statewide once-a-year monitoring
- Regional or local year-round monitoring
- Regional or local once-a-year monitoring

Respondents were aware of the following monitoring efforts by other organizations for wildlife in rivers and streams habitat in Indiana (not ranked):

- Statewide year-round monitoring
- Statewide once-a-year monitoring
- Regional or local year-round monitoring

Respondents ranked monitoring efforts by state agencies based on their importance for conservation of wildlife in rivers and streams habitat in Indiana:

Rank	Monitoring efforts by state agencies for conservation of wildlife in rivers and streams habitat
1	Statewide year-round monitoring
2	Regional or local once-a-year monitoring
3	Regional or local year-round monitoring
4	Statewide once-a-year monitoring

Respondents ranked monitoring efforts by other organizations based on their importance for conservation of wildlife in rivers and streams habitat in Indiana:

Rank	Monitoring efforts by other organizations for conservation of wildlife in rivers and streams habitat
1	Statewide year-round monitoring
2	Regional or local year-round monitoring

Respondents listed regional or local monitoring by state agencies for wildlife in rivers and streams habitat in Indiana (not ranked):

- State monitoring: Banding and nest box surveys
- Several fish and wildlife areas perform annual wood duck banding. Properties include Hovey Lake, Glendale, Minnihaha, Willow Slough, Jasper-Pulaski, LaSalle, Pigeon River, and Tri-County FWAs. There might be others.
- Fish and wildlife areas [not specific in types of monitoring or species being monitored]: Hovey Lake, Tri-County, Jasper-Pulaski, Winamac, Willow Slough, LaSalle

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Respondents listed regional or local monitoring by other organizations for wildlife in rivers and streams habitat in Indiana:

- Muscatatuck NWR
 - Conducts wood duck banding operations

Respondents listed organizations that monitor wildlife in rivers and streams habitat in Indiana (not ranked):

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

Respondents considered monitoring techniques for wildlife in rivers and streams habitat in Indiana:

Monitoring techniques for wildlife in rivers and streams habitat	Used	Not used but possible with existing technology and data	Not economically feasible
Radio telemetry and tracking	--	X	--
Modeling	X	--	--
Driving a survey route	--	X	--
Reporting from harvest, depredation, or unintentional take (road kill, by-catch)	X	--	--
Mark and recapture	X	--	--
Professional survey/census	X	--	--
Volunteer survey/census	X	--	--
Trapping (by any technique)	X	--	--

Respondents noted another monitoring techniques for wildlife in rivers and streams habitat in Indiana:

- Nest box surveys

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 rivers and streams habitat. There were no responses.

Habitat inventory and assessment

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Respondents were aware of the following inventory and assessment efforts by state agencies for rivers and streams habitat in Indiana:

- Statewide annual inventory and assessment
- Regional or year-round inventory and assessment

Respondents were aware of the following inventory and assessment efforts by other organizations for rivers and streams habitat in Indiana:

- Statewide annual inventory and assessment
- Regional or year-round inventory and assessment

Respondents ranked inventory and assessment efforts by state agencies based on their importance for conservation of rivers and streams habitat in Indiana:

Rank	Inventory and assessment by state agencies for conservation of rivers and streams habitat
1	Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment
2	Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
3 (tie)	Statewide annual inventory and assessment
3 (tie)	Statewide once-a-year inventory and assessment
4 (tie)	Regional or local year-round inventory and assessment
4 (tie)	Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment
5	Regional or local once-a-year inventory and assessment
6	Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment

Respondents ranked inventory and assessment efforts by other organizations based on their importance for conservation of rivers and streams habitat in Indiana:

Rank	Inventory and assessment by other organizations for conservation of rivers and streams habitat
1 (tie)	Statewide annual inventory and assessment
1 (tie)	Regional or local year-round inventory and assessment

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A respondent listed regional or local inventory and assessment by state agencies for rivers and streams habitat in Indiana:

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

A respondent listed regional or local inventory and assessment by other organizations agencies for rivers and streams habitat in Indiana:

- Many local zoning boards, planning commissions and drainage boards also keep and maintain their own records regarding land use patterns within these habitats

A respondent listed organizations that monitor rivers and streams habitat in Indiana (not ranked):

- IDNR
- USFWS
- USDA
- IDEM
- USACOE
- EPA
- Local government entities (area plan commissions, zoning boards, etc.)

Respondents considered inventory and assessment techniques for rivers and streams habitat in Indiana:

Inventory and assessment techniques for rivers and streams habitat	Used	Not used but possible with existing technology and data	Not economically feasible
GIS mapping	X	--	--
Aerial photography and analysis	X	--	--
Systematic sampling	--	X	--
Property tax estimates	X	--	--
Regulatory information	X	--	--
Participation in land use programs	X	--	--

Respondents listed no additional inventory and assessment techniques for rivers and streams habitat in Indiana.

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 rivers and streams habitat. There were no responses.

Recommended monitoring

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Species monitoring

Respondents recommended the following monitoring techniques for effective conservation of wildlife in rivers and streams habitat in Indiana (not ranked):

- Brood surveys
- Continued participation in HIP is perhaps the most cost effective method for monitoring the flyway population.
- Banding operations help determine status of local and statewide populations
- Increased banding efforts

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 rivers and streams habitat. There were no responses.

Habitat inventory and assessment

Respondents recommended the following inventory and assessment techniques for effective conservation of rivers and streams habitat in Indiana (not ranked):

- GIS mapping
 - Developing and maintaining accurate GIS data sets on habitat is important
- Aerial photography and analysis
- Spring, summer, fall and winter surveys

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 rivers and streams habitat. There were no responses.