Appendix E-39: Mature of High Canopy Stage

6. Please rank the following threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	20% (1)	60% (3)	0% (0)	20% (1)	**5**
High sensitivity to pollution	0% (0)	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Bioaccumulation of contaminants	0% (0)	0% (0)	20% (1)	20% (1)	250% (1)	40% (2)	**5**
Predators (native or domesticated)	0% (0)	20% (1)	40% (2)	20% (1)	0% (0)	20% (1)	**5**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	60% (3)	0% (0)	40% (2)	**5**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	20% (1)	0% (0)	0% (0)	40% (2)	40% (2)	0% (0)	**5**
Unregulated collection pressure	0% (0)	20% (1)	0% (0)	20% (1)	60% (3)	0% (0)	**5**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	20% (1)	40% (2)	0% (0)	40% (2)	**5**
					Total Respondents		**55**

7. Please also rank these threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Habitat loss (feeding/foraging areas)	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Small native range (high endemism)	0% (0)	20% (1)	40% (2)	20% (1)	20% (1)	0% (0)	**5**
Near limits of natural geographic range	0% (0)	0% (0)	20% (1)	20% (1)	40% (2)	20% (1)	**5**
Large home range requirements	0% (0)	40% (2)	0% (0)	20% (1)	40% (2)	0% (0)	**5**
Viable reproductive population size or availability	20% (1)	40% (2)	20% (1)	0% (0)	0% (0)	20% (1)	**5**
Specialized reproductive behavior or low reproductive rates	40% (2)	0% (0)	40% (2)	20% (1)	0% (0)	0% (0)	**5**
Degradation of movement/migration routes	60% (3)	20% (1)	0% (0)	0% (0)	0% (0)	20% (1)	**5**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Unknown	0% (0)	25% (1)	0% (0)	25% (1)	25% (1)	25% (1)	**4**
Other (please specify below)	0% (0)	66% (2)	0% (0)	0% (0)	33% (1)	0% (0)	**3**
					Total Respondents		**52**

8. Other threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Brown-headed cowbird nest parasitism
2. We need to know how the Cerulean Warbler is affected by silviculture and other land management, and how these effect demography.
3. Brood parasitism by Brown-headed Cowbird likely has moderate to strong negative impact on population's success.
4. Brood parasitism by Brown-headed Cowbirds in some Cerulean Warbler populations due to fragmentation of forested habitat

Total Respondents **4**

9. Please briefly describe the top two threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana identified above.

Loss of large blocks of mature forest and increases in forest fragmentation that causes and increase in cowbird nest parasitism and increases edge nest predators (e.g., bluejays). This causes a decrease in recruitment.

1. We still have very little information on Cerulean Warblers. We need to assess basic demography in Indiana and across the breeding range, learn how some species responds to land management, develop an understanding of post-fledging habitat use, and determine the effect of the brown-headed cowbird on some species.

2. Because the Cerulean Warbler is an area-sensitive species, a loss of large tracts of mature forest on both the breeding and wintering grounds is a critical threat.

Brown-headed Cowbird brood parasitism is likely a significant negative impact.
Nest predation may also be important.
Habitat fragmentation may exacerbate both of these.

Loss of contiguous blocks of mature forest
Low reproductive output - possibly 'sink' populations due to poor habitat quality

The top two threats to timber rattlesnakes in this habitat are habitat loss and human persecution. Timber rattlesnakes are often killed because they are large venomous snakes. There is also a market for this species in illegal trade. Individual take coupled with low reproductive rates pose a serious threat for this species.

Total Respondents **4**

10. Please rank the following threats to the HABITAT of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	40% (2)	60% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	20% (1)	40% (2)	0% (0)	40% (2)	**5**
Invasive/non-native species	0% (0)	0% (0)	20% (1)	40% (2)	0% (0)	40% (2)	**5**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	60% (3)	20% (1)	20% (1)	**5**
Habitat fragmentation	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Successional change	40% (2)	0% (0)	20% (1)	20% (1)	0% (0)	20% (1)	**5**
Diseases (of plants that create habitat)	0% (0)	0% (0)	40% (2)	20% (1)	20% (1)	20% (1)	**5**
Habitat degradation	40% (2)	20% (1)	20% (1)	20% (1)	0% (0)	0% (0)	**5**
Climate change	0% (0)	0% (0)	0% (0)	60% (3)	0% (0)	40% (2)	**5**
Stream channelization	0% (0)	20% (1)	0% (0)	20% (1)	40% (2)	20% (1)	**5**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Agricultural/forestry practices	20% (1)	40% (2)	20% (1)	0% (0)	0% (0)	20% (1)	**5**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	40% (2)	20% (1)	40% (2)	**5**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	40% (2)	20% (1)	40% (2)	**5**
Mining/acidification	0% (0)	20% (1)	0% (0)	0% (0)	40% (2)	40% (2)	**5**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	20% (1)	40% (2)	40% (2)	**5**
Unknown	0% (0)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Other (please specify below)	33% (1)	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	**3**
					Total Respondents		**87**

11. Other HABITAT threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Eastern hardwood forests, including those in Indiana, are relatively young and even-aged with less species diversity, vertical structure, natural canopy gaps, large woody debris, and other structural features than pre-European settlement forests. The influence of Native Americans, and particularly the subsequent wave of European expansion across the Midwest, left permanent changes across the landscape of Indiana, changes reflected in the extirpated flora and fauna of the region. Furthermore, the suppression of natural disturbances such as fire has resulted in a shift in species composition, structural complexity, and landscape pattern across much of the region. Fire-intolerant species such as sugar maple and American beech have become established at the expense of fire-adapted oak and hickory species, especially after fire control measures were. Before Eurpean settlement, fires, beavers, floods, and windstorms created extensive openings. The restoration of natural landscapes requires the re-introduction or simulation of these disturbances

	natural landscapes requires the re-introduction or simulation of these disturbances.
2.	Not clear what is causing decline of the Cerulean Warbler; regionally brood parasitism and forest fragmentation may be negative impacts. It may be possible some species geographic range is shifting (climate?). Exact habitat associations of some wildlife species are not known -- not clear what is optimal habitat in Indiana in my view.

Total Respondents **2**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana identified above.

1.	Loss of high quality forest habitat (over mature uneven-aged forest) and forest fragmentation (lots of cowbirds and bluejays). This results in lower quality habitat available to ceruleans.
2.	1. We still do not know the specific habitat preferences for this species. The types of habitats where these species were especially abundant in the past (i.e. old-growth bottomland forest) no longer exist. This area needs more research. 2. The cerulean's dependence on large tracts of mature deciduous forests, make the species especially sensitive to continuing forest fragmentation and isolation. The mechanism by which fragmentation affects populations in Indiana is unknown, but the response of this species to habitat fragmentation may be related to other factors associated with fragment size. Brood parasitism by the Brown-headed Cowbird (Molothrus ater), and high rates of nest predation by generalist predators such as Blue Jay (Cyanocitta cristata) and raccoon (Procyon lotor) are likely factors. Fragmentation of forest in Indiana especially in predominately agricultural landscapes has resulted in small patches of forest surrounded by open habitat that cowbirds require for feeding and nest searching.
3.	Fragmentation of canopied forest habitats Brown-headed Cowbird brood parasitism.
4.	Habitat fragmentation
5.	The top two habitat threats to the timber rattlesnake include forest fragmentation and habitat loss. The timber rattlesnakes need large continuous blocks of forest habitat. When these areas are lost rattlesnakes become susceptible to human and predator encounters.

Total Respondents **5**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (5)	**5**
Statewide once a year monitoring conducted by state agencies	40% (2)	60% (3)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	40% (2)	60% (3)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	40% (2)	60% (3)	**5**

Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (5)	**5**
Regional or local once a year monitoring conducted by state agencies	40% (2)	60% (3)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	20% (1)	80% (4)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	20% (1)	80% (4)	**5**
		Total Respondents	**40**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Statewide once a year monitoring conducted by other organizations	60% (3)	40% (2)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	40% (2)	60% (3)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	20% (1)	80% (4)	**5**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (5)	**5**
Regional or local once a year monitoring conducted by other organizations	80% (4)	20% (1)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	40% (2)	60% (3)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	20% (1)	80% (4)	**5**
		Total Respondents	**40**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Statewide once a year monitoring conducted by state agencies	60% (3)	0% (0)	20% (1)	20% (1)	0% (0)	**5**

Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	40% (2)	20% (1)	40% (2)	0% (0)	**5**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Regional or local once a year monitoring conducted by state agencies	40% (2)	0% (0)	40% (2)	20% (1)	0% (0)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	20% (1)	60% (3)	20% (1)	0% (0)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	20% (1)	20% (1)	60% (3)	0% (0)	**5**
				Total Respondents		**40**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Statewide once a year monitoring conducted by other organizations	60% (3)	0% (0)	20% (1)	20% (1)	0% (0)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	40% (2)	20% (1)	40% (2)	0% (0)	**5**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	40% (2)	0% (0)	60% (3)	0% (0)	**5**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Regional or local once a year monitoring conducted by other organizations	40% (2)	0% (0)	20% (1)	40% (2)	0% (0)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	20% (1)	60% (3)	20% (1)	0% (0)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	20% (1)	40% (2)	40% (2)	0% (0)	**5**
				Total Respondents		**40**

17. Regional or local state agency monitoring for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Local breeding bird surveys done on State properties and private land. State cooperates in national breeding bird survey. State biologists also survey in local habitats (e.g.,Patoka River)
2. Indiana Breeding Bird Atlas project through DNR determines statewide distribution periodically. Does not produce quantitative measure of population size. These are not tied to this habitat type, but frequency of the other Cerulean habitats in the BBS coverage is low so most data refer to this habitat.
3. IDNR has monitored timber rattlesnake in Brown, Monroe, and Morgan counties.

Total Respondents 3

18. Regional or local monitoring by other organizations for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Audubon supports May Day count throughout state which detects cerulean warblers. TNC is working on developing a research project in the state for ceruleans.
2. 1. BBS routes provide some information for this species. However, most routes are located along roads and do not adequately monitor interior forest species such as the cerulean.

   2. The Hoosier National Forest conducts breeding bird point counts each year along points located in interior forest blocks or varying fragment size. Although the cerulean is not the focus of this study, data is collected on its occurrence.

   3. Cornell Lab of Ornithology collects data on the cerulean warbler for their program "Birds in Forested Landscapes." I am unsure whether data has been collected and submitted in Indiana.

   4. Ball State has been conducting studies on the Hoosier and Big Oaks for this species. Currently, students from this university are working in conjunction with the Hoosier.
3. USGS roadside Breeding Bird Survey. These are not tied to this habitat type, but frequency of the other Cerulean habitats in the BBS coverage is low so most data refer to this habitat.
4. The USFS has contracted out survey work in the southern portions of the Hoosier National Forest.

Total Respondents 4

19. Please list organizations that are monitoring the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. USFWS, INDNR, TNC, Audubon, American Bird Conservancy, MAPS program (Point Reyes Bird Observatory), Local bird clubs, NRCS (thru WRP program monitoring)
2. 1. Hoosier National Forest
   2. Ball State University
   3. USFWS - Big Oaks
3. Indiana Department of Natural Resources (breeding bird atlas project)
   USGS roadside bird surveys
4. Ball State University, Department of Biology has been monitoring Cerulean Warbler populations at Big Oaks National Wildlife Refuge, Hoosier National Forest, and Yellowwood and Morgan-Monroe

Big Oaks National Wildlife Refuge, Hoosier National Forest, and Yellowwood and Morgan-Monroe state forests during the last 5 years

5. USFS

Total Respondents **5**

20. What are the current monitoring techniques for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	50% (2)	0% (0)	25% (1)	25% (1)	0% (0)	0% (0)	**4**
Modeling	20% (1)	40% (2)	40% (2)	0% (0)	0% (0)	0% (0)	**5**
Coverboard routes	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	0% (0)	**3**
Spot mapping	33% (2)	17% (1)	50% (3)	0% (0)	0% (0)	0% (0)	**6**
Driving a survey route	50% (3)	17% (1)	33% (2)	0% (0)	0% (0)	0% (0)	**6**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	0% (0)	**3**
Mark and recapture	40% (2)	40% (2)	20% (1)	0% (0)	0% (0)	0% (0)	**5**
Professional survey/census	67% (4)	33% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**6**
Volunteer survey/census	67% (4)	0% (0)	33% (2)	0% (0)	0% (0)	0% (0)	**6**
Trapping (by any technique)	0% (0)	100% (4)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Representative sites	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Probabilistic sites	0% (0)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Other (please specify below)	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
					Total Respondents		**59**

21. Other monitoring techniques for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Nest monitoring, territory mapping, call playback, and color banding (same as mark recapture?)
2. Point count surveys.
3. Nest search and monitoring

Total Respondents 3

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

1. A study that experimentally tests how forest management influences demography and presence and absence. Some wildlife species need basic life history studied, too.
2. We would benefit from obtaining basic demography data on this species. Mist-netting is not particularly feasible because the species stays so high in the canopy. Due to the difficulty of locating nests of ceruleans and of capturing adults, especially females, determination of reproductive success is problematic. Assessing survivorship of eggs, nestlings, and fledglings is also difficult. Until such reproductive success and survivorship information is available, the dynamics of populations will continue to be unknown.

   Point counts, spot mapping, and territory mapping provide important information about ceruleans. Banding individual birds could supply information on site fidelity and survivorship.

   Regular monitoring of migratory stopover and winter habitats will also be an important part of the conservation of the cerulean warbler.
3. Roadside bird surveys on selected routes maximizing forest habitats.
   Repeated point count surveys in representative forest sites.
4. Professional Survey/Census - To locate Cerulean Warblers
   Nest search and monitoring - To assess productivity to determine if Indiana has a 'source' or 'sink' population of Cerulean Warblers
   Hutto, R.L., S.M. Pletschett, and T.P. Hendricks. 1986. A fixed-radius point-count method for nonbreeding and breeding season use. Auk 103:593-602.
5. I would recommend the use of radio-telemetry, mark recapture techniques, and transect surveys. Due to the cryptic nature of these snakes, locating individuals without the help of telemetry is extremely difficult. Many studies conducted locally and nationally have included telemetry in their methods.

   ; I would recommend the use of radio-telemetry, mark recapture techniques, and transect surveys. Due to the cryptic nature of these snakes, locating individuals without the help of telemetry is extremely difficult. Many studies conducted locally and nationally have included telemetry in their methods.

Total Respondents 6

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

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

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

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

Total Respondents	**32**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats 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	These efforts are not crucial for this HABITAT	Unknown	Response Total

Appendix E-39: Mature of High Canopy Stage

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. The state examines habitat on state properties periodically and uses GAP and other habitat modeling programs to assess forest habitats.
2. There are none that I know.
3. These habitat assessments might occur in Indiana, but I am not positive how often these activities take place.

Total Respondents **3**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. TNC and USFWS and Forest Service uses habitat models to examine forest habitat in Indiana (Hoosier NF and Big Oaks NWR).

1.	1. Hoosier National Forest and Ball State University are collecting data on habitat use by cerulean warblers on the northern portion of the Forest.
2.	2. Cornell's "Birds in Forested Landscapes" collects some data on habitat use. I am not sure if data has been submitted from Indiana.
3.	These habitat assessments might occur in Indiana, but I am not positive how often these activities take place.

Total Respondents 3

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1.	INDNR, USFWS, USFS, TNC
2.	1. Hoosier National Forest 2. Ball State University 3. Cornell Lab of Ornithology
3.	Ball State University, Department of Biology has been monitoring Cerulean Warbler populations at Big Oaks National Wildlife refuge, Hoosier national Forest, and Yellowwood and Morgan-Monroe state forests during the last 5 years
4.	I would assume the Nature Conservancy, IDNR, USFS, and other organizations monitior these habitats

Total Respondents 4

30. If a technique is not applicable to the Wildlife in Mature or High Canopy Stage Forest Habitats do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Aerial photography and analysis	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Systematic sampling	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
State revenue data	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Regulatory information	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Participation in	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**

landuse programs							
Modeling	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Voluntary landowner reporting	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
					Total Respondents		**24**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Samples at known nest sites are compared with random sites at Big Oaks NWR
2. There have been several Master's projects on habitat selection for the Cerulean Warbler in Indiana. These studies have collected the following information on habitat use: diameter at breast height (DBH) and identification of tree species in a nested plot at the center of a territory, number of saplings (trees <3cm DBH) , number and DBH of standing dead trees (snags) , Canopy cover, ground cover, canopy height, percent canopy coverage and ground cover, canopy height, and vertical stratification of foliage
3. I am not sure what techniques are being applied to assess this habitat

Total Respondents **3**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

1. GIS modeling, and intensive study to determine habitat quality (source vs. sink)
2. 1. I think that a crucial piece of habitat data for the cerulean warbler is the size and distribution of canopy gaps within territories. At this point, researchers have not determined an effective means to quantify this data.

   2. Another important habitat inventory would be looking at landscape characteristics of cerulean occurrence and distribution in relation to forest fragmentation. Monitoring should incorporate the occurrence of the species in relation to landscape characteristics such as proportion of agricultural use, tract size and shape, and amount of edge.
3. Habitat association studies to determine which habitat types used/ preferred in IN.
   GIS/aerial photo analysis to map these habitat types.
4. Systematic sampling/survet techniques - To locate Cerulean Warblers
   Hutto et al. 1986. Auk 103:593-602

Total Respondents **4**

Appendix E-39: Mature of High Canopy Stage

33. What is the current body of science for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	0	0%
Inadequate	5	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		5

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana, if available. This resource may be used if further detail is needed.

		Response Total	Response Percent
Title	Cerulean Warbler MS Thesis Habitat Selection and Territory Size of Cerulean Warblers in Southern Indiana Habitat selection and reproductive success of Cerulean Warblers in Southern Indiana Spatial Ecology of the Timber Rattlesnake in south central Indiana	4	100%
Author	Kirk Roth Cynthia M. Basile Kamal Islam and Kirk L.Roth Walker and Kingsbury	4	100%
Date	2004 6/02 December 2004 2000	4	100%
Publisher	Ball State University N/A Department of Biology Technical Report No. 4, Ball State University, submitted to U.S. Fish & Wildlife Service, Fort Snelling, MN	4	100%

	Masters Thesis, IPFW		
		Total Respondents	**4**

35. If possible, please provide a second citation (title, author, date, publisher) that would give another good overview of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana. This resource may also be used if further detail is needed.

		Response Total	Response Percent
Title	Cerulean Warbler MS Thesis Master's Thesis (Title Unknown) Relative abundance and habitat selection of Cerulean Warblers in Southern Indiana | Blank	**3**	**75%**
Author	Cindy Basile Kirk Roth Kamal Islam and Cynthia Basile	**4**	**100%**
Date	Gibson and Kingsbury 2002 6/2004 December 2002 2003	**4**	**100%**
Publisher	Ball State University Department of Biology Technical Report No. 1, Ball State university, final report submitted to U.S. Fish & Wildlife Service, Fort Snelling, MN Masters Thesis, IPFW	**3**	**75%**
		Total Respondents	**3**

36. What is the current HABITAT body of science for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		**0**	**0%**
Adequate		**1**	**20%**

Inadequate	3	60%
Nonexistent	1	20%
Other (please explain below)	0	0%
Total Respondents		5

37. Please provide a citation (title, author, date, publisher) that would give the best HABITAT overview of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana, if available. This resource may be used if further detail is needed.

		Response Total	Response Percent
Title	Cerulean Warbler MS Thesis see earlier entries The natural regions of Indiana	3	100%
Author	Kirk Roth Homoya, M.A., D.B. Abrell, J.R. Aldrich, and T.W. Post	2	67%
Date	2004 1985	2	67%
Publisher	Ball State University Proceedings of the Indiana Academy of Science 94:245-268	2	67%
	Total Respondents		3

38. If possible, please provide a second citation (title, author, date, publisher) that would give another good HABITAT overview of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana. This resource may also be used if further detail is needed.

		Response Total	Response Percent
Title	Cerulean Warbler MS Thesis	1	100%
Author	Cindy Basile	1	100%
Date	2002	1	100%
Publisher	Ball State University	1	100%
	Total Respondents		1

39. What are the research needs for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	60% (3)	0% (0)	0% (0)	20% (1)	20% (1)	0% (0)	5
Distribution and abundance	40% (2)	40% (2)	20% (1)	0% (0)	0% (0)	0% (0)	5

Limiting factors (food, shelter, water, breeding sites)	80% (4)	0% (0)	20% (1)	0% (0)	0% (0)	0% (0)	**5**
Threats (predators/competition, contamination)	80% (4)	0% (0)	20% (1)	0% (0)	0% (0)	0% (0)	**5**
Relationship/dependence on specific habitats	80% (4)	20% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Population health (genetic and physical)	40% (2)	40% (2)	0% (0)	0% (0)	20% (1)	0% (0)	**5**
Other (please specify below)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**31**

40. Other research needs for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Effects of Forestry practices on demography and presence and absence of cerulean warblers (TNC) proposed study

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Urgently needed	**Greatly needed**	**Needed**	**Slightly needed**	**Not needed**	**Unknown**	**Response Total**
Successional changes	20% (1)	40% (2)	40% (2)	0% (0)	0% (0)	0% (0)	**5**
Distribution and abundance (fragmentation)	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Threats (land use change/competition, contamination/global warming)	80% (4)	20% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**5**
Relationship/dependence on specific site conditions	80% (4)	0% (0)	20% (1)	0% (0)	0% (0)	0% (0)	**5**
Growth and development of individual components of the habitat	40% (2)	20% (1)	20% (1)	0% (0)	20% (1)	0% (0)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**25**

42. Other HABITAT research needs for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

1. Effects of forestry practices on cerulean warbler presence or absence and on demography

Total Respondents **1**

43. How well do the following conservation efforts address the threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	60% (3)	20% (1)	0% (0)	0% (0)	20% (1)	**5**
Population management (hunting, trapping)	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Reintroduction (restoration)	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Food plots	0% (0)	0% (0)	60% (3)	40% (2)	0% (0)	**5**
Threats reduction	20% (1)	20% (1)	0% (0)	40% (2)	20% (1)	**5**
Native predator control	0% (0)	40% (2)	0% (0)	40% (2)	20% (1)	**5**
Exotic/invasive species control	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Regulation of collecting	20% (1)	0% (0)	40% (2)	40% (2)	0% (0)	**5**
Disease/parasite management	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Translocation to new geographic range	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Protection of migration routes	20% (1)	0% (0)	20% (1)	20% (1)	40% (2)	**5**
Limiting contact with pollutants/contaminants	0% (0)	20% (1)	20% (1)	40% (2)	20% (1)	**5**
Public education to reduce human disturbance	0% (0)	40% (2)	40% (2)	0% (0)	20% (1)	**5**
Culling/selective removal	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Stocking	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents	**80**

44. Other current conservation practices for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

1. Increasing the area of mature forest in the landscape and decreasing fragmentation. The conservation of existing forest land is also critical.
2. 1. We desperately need to learn how silvicultural activities and land management affect this species. Are there silvicultural activities (such as single-tree selection) that actually improve cerulean warbler habitat.

2. Increasing the size and reducing the fragmentation of forest blocks within the state will likely improve habitat for this species.

3. Maintenance of contiguous forest areas.

4. Habitat protection (maintenance of old-growth/mature forest components in Indiana)
Additional research (nest productivity, annual monitoring of populations to assess trends in population numbers)
Hamel, P.B. 2000. Cerulean Warbler (Dendroica cerulea). In The Birds of North America, no. 511 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia.
Islam, K. and K.L. Roth. 2004. Habitat Selection and Reproductive Success of Cerulean Warblers in Southern Indiana. Final report submitted to U.S. Fish and Wildlife Service, Fort Snelling, MN, December 2002. Department of Biology Technical Report No. 4, Ball State University, Muncie, Indiana 51pp.
Islam, K. and C. Basile. 2002. Relative abundance and habitat selection of Cerulean Warblers in Southern Indiana. Final report submitted to U.S. Fish and Wildlife Service, Fort Snelling, MN, December 2002. Department of Biology Technical Report No. 1, Ball State University, Muncie, Indiana 76pp.

5. I would recommend public education and habitat protection.

Total Respondents **5**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	40% (2)	0% (0)	60% (3)	0% (0)	**5**
Habitat protection on public lands	60% (3)	40% (2)	0% (0)	0% (0)	0% (0)	**5**
Habitat protection incentives (financial)	0% (0)	40% (2)	0% (0)	40% (2)	20% (1)	**5**
Habitat restoration through regulation	20% (1)	20% (1)	0% (0)	40% (2)	20% (1)	**5**
Habitat restoration on public lands	40% (2)	40% (2)	0% (0)	0% (0)	20% (1)	**5**
Habitat restoration incentives (financial)	0% (0)	40% (2)	20% (1)	0% (0)	40% (2)	**5**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	20% (1)	60% (3)	20% (1)	**5**
Succession control (fire, mowing)	0% (0)	20% (1)	0% (0)	60% (3)	20% (1)	**5**
Corridor development/protection	0% (0)	40% (2)	0% (0)	60% (3)	0% (0)	**5**
Managing water regimes	0% (0)	0% (0)	0% (0)	80% (4)	20% (1)	**5**
Pollution reduction	0% (0)	20% (1)	0% (0)	60% (3)	20% (1)	**5**
Protection of adjacent buffer zone	0% (0)	40% (2)	0% (0)	40% (2)	20% (1)	**5**
Restrict public access and disturbance	20% (1)	0% (0)	60% (3)	20% (1)	0% (0)	**5**
Land use planning	20% (1)	40% (2)	0% (0)	0% (0)	40% (2)	**5**
Technical assistance	0% (0)	60% (3)	0% (0)	20% (1)	20% (1)	**5**

Cooperative land management agreements (conservation easements)	40% (2)	40% (2)	0% (0)	0% (0)	20% (1)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents	**85**

47. Other current HABITAT conservation practices for the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Mature or High Canopy Stage Forest Habitats in Indiana?

1. Land use planning and habitat protection and restoration on public and private land.
2. Due to natural succession and the reduction of natural disturbance, sugar maple and American beech are increasing in stand density and basal area at the expense of the oak-hickory overstory throughout many of the forests in the state. A shift in forest composition from oak-hickory to maple-beech dominated forests has implications for many wildlife species. This shift could result in a reduction of species richness and abundance within forest bird communities and may negatively influence the cerulean warbler. Differences in foliage and bark structure may affect arthropod (spiders and related species) availability for this species. And, the short-petioled leaves and furrowed bark of oak trees compared to maples may provide better foraging opportunities for these birds.
3. Promotion of older growth forest on public and private lands.
4. Habitat protection (maintenance of old growth/mature forest components in Indiana)
   Aditional research (nest productivity, annual monitoring of populations to assess trends)
   Hamel P.B. 2000. (see complete citation elsewhere)
   Islam and Roth. 2004. (see complete citation elsewhere)
   Islam and Basile. 2002. (see complete citation elsewhere)

Total Respondents **4**

49. Do you have any additional comments or information on the Wildlife in Mature or High Canopy Stage Forest Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

1. There is still a lot unknown about cerulean warblers. We need to improve our knowledge and to see what is limiting population growth (could be wintering area habitat loss or poor survival in addition to breeding habitat problems). We need to encourage a forest landscape wherever possible (that includes actively managed forest lands) to increase the amount of forest in the landscape and actively encourage a percantage of that landscape to be in mature forests.

2. Recently The Nature Conservancy has held meetings with many agencies and universities to determine the feasibility of conducting a landscape ecology project for the cerulean warbler. This project would focus on the response of this species to silvicultural practices and could yield very useful information. Basic demography data could also be collected. With proper funding, many other species that use this habitat type could be studied as well. A key issue to cerulean warbler conservation is research. Before effective conservation strategies can be developed, a lot of questions will need to be answered.

Total Respondents **2**

6. Please rank the following threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

8. Other threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana identified above.

1. availability and quality of suitable nesting/feeding habitat.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Old Forest Stage Forest Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Invasive/non-native species	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat fragmentation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Successional change	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat degradation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Stream channelization	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Impoundment of water/flow regulation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**

Agricultural/forestry practices	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Mining/acidification	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**16**

11. Other HABITAT threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana identified above.

1. Loss of cavity trees and harvest of older forests.

Total Respondents **1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
				Total Respondents		**8**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

17. Regional or local state agency monitoring for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

1. Breeding Bird Atlas - statewide

Total Respondents 1

18. Regional or local monitoring by other organizations for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

1. federal Breeding Bird Surveys - statewide. Regional May Day Bird Counts, Summer Bird Counts, Christmas Bird Counts

Total Respondents 1

19. Please list organizations that are monitoring the Wildlife in Old Forest Stage Forest Habitats in Indiana.

1. USGS, birding groups, National Audubon Society

Total Respondents 1

20. What are the current monitoring techniques for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

Representative sites	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**9**

21. Other monitoring techniques for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

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

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

1. federal Breeding Bird Surveys annually statewide.

Total Respondents	**1**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

Total Respondents	**8**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

1. None

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

1. Periodical aerial imagery

Total Respondents **1**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

1. USDA?, USGS?

Total Respondents **1**

30. If a technique is not applicable to the Wildlife in Old Forest Stage Forest Habitats do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Systematic sampling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Participation in landuse programs	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

1. Aerial imagery and modeling

Total Respondents **1**

33. What is the current body of science for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

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

		Response Total	Response Percent
Title	Breeding Bird Atlas of Indiana	1	100%
Author	Castrale, Hopkins, Keller	1	100%
Date	1988	1	100%
Publisher	IDNR	1	100%
		Total Respondents	1

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

		Response Total	Response Percent
Title	BNA Account - Pileated Woodpecker	1	100%
Author	E.L. Bull and J.A. Jackson	1	100%
Date	1995	1	100%
Publisher	American Ornitholgists' Union	1	100%
		Total Respondents	1

36. What is the current HABITAT body of science for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

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

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

Total Respondents	**1**

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

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

39. What are the research needs for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

40. Other research needs for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

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

41. What are the HABITAT research needs for the Wildlife in Old Forest Stage Forest Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

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

43. How well do the following conservation efforts address the threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Threats reduction	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Native predator control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Limiting contact with pollutants/contaminants	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Public education to reduce human disturbance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**16**

44. Other current conservation practices for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

1. Conservation of forests and wise timber management empahsizing older forests.

Total Respondents **1**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Old Forest Stage Forest Habitats in Indiana?

	Very well	**Somewhat**	**Not at all**	**Not used**	**Unknown**	**Response Total**
Habitat protection through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat protection on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat protection incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration through regulation	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Habitat restoration on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Succession control (fire, mowing)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Corridor development/protection	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Managing water regimes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Pollution reduction	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Protection of adjacent buffer zone	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Restrict public access and disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Land use planning	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Technical assistance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Cooperative land management agreements (conservation easements)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**17**

47. Other current HABITAT conservation practices for the Wildlife in Old Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Old Forest Stage Forest Habitats in Indiana?

1. Incentives to preserve forests and use good timber managements practices.

Total Respondents **1**

49. Do you have any additional comments or information on the Wildlife in Old Forest Stage Forest Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

Appendix E-41: Pole Stage

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

6. Please rank the following threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
High sensitivity to pollution	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Bioaccumulation of contaminants	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Predators (native or domesticated)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
					Total Respondents		**10**

7. Please also rank these threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**9**

8. Other threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana identified above.

1. Eastern Towhee is considered a habitat generalist that uses early successional habitats within deciduous forests. With prevailing land management that does not generate early succession habitat (such as maturation of forest on former farm lands), habitat is reduced. A second top threat is probably loss of nest and nesting females to cats, chipmunks, snakes and other ground predators.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Invasive/non-native species	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Habitat fragmentation	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Successional change	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Habitat degradation	0% (0)	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	**2**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Stream channelization	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**

Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Agricultural/forestry practices	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**32**

11. Other HABITAT threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana identified above.

1. Primary sources of loss of young forest habitats in Indiana are urban development / sprawl into remaining forest areas, and maturation of existing forest out of young forest age classes.; Primary sources of loss of young forest habitats in Indiana are urban development / sprawl into remaining forest areas, and maturation of existing forest out of young forest age classes.

Total Respondents **2**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
		Total Respondents	**8**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	**0**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	100% (1)	0% (0)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (1)	**1**
		Total Respondents	**7**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

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

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

17. Regional or local state agency monitoring for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. State-wide breeding bird atlas efforts are coordinated by the state DNR. This atlas effort was done in the 1980s, and is being redone now. Also the state DNR nongame bird program coordinates publication of a summer bird count that generates some data on towhee numbers (along with all other summer birds. No analysis is done, however.

Total Respondents 1

18. Regional or local monitoring by other organizations for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. Other bird monitoring efforts that collect data nationwide generate information on eastern towhees. These include the Breeding Bird Surveys, Christmas Bird Counts (towhees are rare in winter, though), Cornell nest record program. The Hoosier National Forest conducts breeding bird monitoring on the forest since 1991.

Total Respondents 1

19. Please list organizations that are monitoring the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. USGS coordinates the Breeding Bird Survey, National Audubon Society coordinates the Christmas Bird Counts, Cornell's Laboratory of Ornithology collects the nest records, federal agencies do monitoring on lands they manage within the state (e.g., Hoosier NF).

Total Respondents 1

20. What are the current monitoring techniques for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Spot mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Driving a survey route	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Reporting from harvest, depredation, or unintentional take (road kill,	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**

bycatch)							
Mark and recapture	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Professional survey/census	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Volunteer survey/census	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Trapping (by any technique)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Representative sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**5**

21. Other monitoring techniques for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

1. Primary technique used is point counts of singing birds in breeding season, either by roadside counts (BBS) or set survey points (e.g., Hoosier NF monitoring). Roadside surveys are probably most effective because towhees are edge/early successional species, using habitats found near roads. Long term banding programs (e.g., MAPS) provide demographic information not gained with other monitoring, but are more intensive.

Total Respondents **1**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

	These efforts are very crucial	**These efforts are somewhat crucial for**	**These efforts are slightly**	**These efforts are not crucial**	**Unknown**	**Response Total**

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. Forest inventory plots in established forest management lands give some information on trends in early succession habitat. But I am unaware of any regular coordinated effort by state or other agencies to monitor young forest age classes. Analysis of remote sensing data can provide some trend information where young forest classes can be mapped.

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. see above

Total Respondents **1**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. see above

Total Respondents **1**

30. If a technique is not applicable to the Wildlife in Pre-Forest Stage Forest Habitats do not select a response in that row.

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	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Systematic sampling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**9**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

1. As stated before, I am unaware of efforts to monitor young age classes of forest. GIS mapping can certainly generate amounts and trends of habitat if forest type and age are mapped. Aerial photography can be used when young age classes appear distinct from other habitat classes.

Total Respondents **1**

33. What is the current body of science for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

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

		Response Total	Response Percent
Title	Eastern Towhee, Birds of North American account #262	1	100%
Author	Greenlaw, J.S.	1	100%
Date	1996	1	100%
Publisher	The Birds of North America, Inc.	1	100%
Total Respondents			1

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

		Response Total	Response Percent
Title	Decline of the Rufous-sided Towhee in the eastern United States	1	100%
Author	Hagan, J.M.	1	100%
Date	1993	1	100%
Publisher	Auk 110:863-874.	1	100%
Total Respondents			1

36. What is the current HABITAT body of science for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

Inadequate	1	100%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		1

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

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

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

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

39. What are the research needs for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	1
Distribution and abundance	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	1
Threats (predators/competition, contamination)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	1

Relationship/dependence on specific habitats	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Population health (genetic and physical)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**6**

40. Other research needs for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. The eastern towhee is a well-known, fairly common species. The general life-history literature is extensive. Population trends, habitat needs and threats are not well defined for Indiana. The documented population declines in databases such as the Breeding Bird Surveys are poorly explained.

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. Forest succession is well understood in Indiana. But the relationship between towhee occupancy and habitat age is not explicitly well studied here.

Total Respondents **1**

43. How well do the following conservation efforts address the threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

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	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Threats reduction	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Native predator control	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Exotic/invasive species control	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Regulation of collecting	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Public education to reduce human disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**15**

44. Other current conservation practices for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

1. Education of public to reduce losses due to exotic predators such as cats is probably important to some local populations.

Total Respondents **1**

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

1. The major need is regional land management plans that retain young forest age classes and mixes of habitats within regional landscapes. Second practice may be exotic plant control. Garlic mustard and Amur honeysuckle have the ability to change vegetative structure of ground and understory layers. As ground nester and ground forager, towhees could be affected, but this is unstudied.

Total Respondents **1**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat protection on public lands	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat protection incentives (financial)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat restoration through regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat restoration on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration incentives (financial)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Succession control (fire, mowing)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Corridor development/protection	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Managing water regimes	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Pollution reduction	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Protection of adjacent buffer zone	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Restrict public access and disturbance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Land use planning	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Technical assistance	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Cooperative land management agreements (conservation easements)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**15**

47. Other current HABITAT conservation practices for the Wildlife in Pre-Forest Stage Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Pre-Forest Stage Forest Habitats in Indiana?

1. Encouragement of forest management plans that retains / creates mix of young and older forest should retain towhees in regional avifaunas. Forest habitat restoration provides habitat in early stages.

Total Respondents **1**

49.	Do you have any additional comments or information on the Wildlife in Pre-Forest Stage Forest Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?
1.	Eastern towhee is a non-endangered but declining species across much of the United States. It is not the focus of specific monitoring efforts (because it is not on threatened lists), but it has shown sharp declines. Indiana populations on the Breeding Bird Survey show a negative (-1%/year) but nonsignificant decline. The species is best used as an indicator on young forest age-classes within a management district or region.
	Total Respondents **1**

6. Please rank the following threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**

Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

8. Other threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana identified above.

1. Loss and degradation of breeding and foraging habitats along river corridors and uplands.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Invasive/non-native species	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat fragmentation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Successional change	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat degradation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

Stream channelization	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Impoundment of water/flow regulation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Agricultural/forestry practices	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Residual contamination (persistent toxins)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Mining/acidification	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**16**

11. Other HABITAT threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana identified above.

1. Loss and habitat degradation of forested habitat along riparian areas and in uplands.

Total Respondents **1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

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

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

17. Regional or local state agency monitoring for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

1. statewide Breeding Bird Atlas; periodic local studies in southern Indiana

Total Respondents **1**

18. Regional or local monitoring by other organizations for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

1. statewide Breeding Bird Survey. Periodci area surveys in the Hoosier National Forest.

Total Respondents **1**

19. Please list organizations that are monitoring the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

1. USFS, universities

Total Respondents **1**

20. What are the current monitoring techniques for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

technique)							
Representative sites	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**9**

21. Other monitoring techniques for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

1. Road/streamside surveys in appropriate habitat.

Total Respondents **1**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (1)	**1**
		Total Respondents	**8**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a						

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

1. unknown

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

1. USDA, USGS? statewide

Total Respondents **1**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

1. USFS, USDA?

Total Respondents **1**

30. If a technique is not applicable to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats do not select a response in that row.

	Frequently used	**Occasionally used**	**Not used but possible with existing technology and data**	**Not used and not possible with existing technology and data**	**Not economically feasible**	**Unknown**	**Response Total**
GIS mapping	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**

Systematic sampling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Participation in landuse programs	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Voluntary landowner reporting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

1. Aerial imagery coupled with modeling.

Total Respondents **1**

33. What is the current body of science for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

Total Respondents	**1**

34. Please provide a citation (title, author, date, publisher) that would give the best overview of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana, if available. This resource may be used if further detail is needed.

		Response Total	Response Percent
Title	Atlas of Breeding Birds of Indiana	**1**	**100%**
Author	Castrale, JS., E Hopkins, C Keller	**1**	**100%**
Date	1988	**1**	**100%**
Publisher	IDNR	**1**	**100%**
	Total Respondents	**1**	

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

		Response Total	Response Percent
Title	BNA Account - Red-shouldered Hawk	**1**	**100%**
Author	ST Crocoll	**1**	**100%**
Date	1994	**1**	**100%**
Publisher	American Ornithologists' Union	**1**	**100%**
	Total Respondents	**1**	

36. What is the current HABITAT body of science for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

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

	Response Total	Response Percent

Title	see previous citations	**1**	**100%**
Author		**0**	**0%**
Date		**0**	**0%**
Publisher		**0**	**0%**
		Total Respondents	**1**

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

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

39. What are the research needs for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

40. Other research needs for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

41. What are the HABITAT research needs for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

43. How well do the following conservation efforts address the threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Threats reduction	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Native predator control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Exotic/invasive species control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Limiting contact with pollutants/contaminants	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Public education to reduce human disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**16**

44. Other current conservation practices for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

1. Incentives to conserve wooded riparian corridors and responsible forestry practices.

Total Respondents **1**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

	Very well	**Somewhat**	**Not at all**	**Not used**	**Unknown**	**Response Total**
Habitat protection through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat protection on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat protection incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Succession control (fire, mowing)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Corridor development/protection	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Managing water regimes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Pollution reduction	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Protection of adjacent buffer zone	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Restrict public access and disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Land use planning	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Technical assistance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Cooperative land management agreements (conservation easements)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**17**

47. Other current HABITAT conservation practices for the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats in Indiana?

1. Incentives to conserve wooded riparian corridors.

Total Respondents **1**

49. Do you have any additional comments or information on the Wildlife in Riparian Wooded Corridors/Streams Forest Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

Appendix E-44: Suburban

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

6. Please rank the following threats to the Wildlife in Upland Forest Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Upland Forest Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**

Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

8. Other threats to the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Upland Forest Habitats in Indiana identified above.

1. Little is known concerning the crowned snake in Indiana. I believe the top threats to this species in Indiana include habitat destruction, habitat fragmentation, and accidental take.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Upland Forest Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Invasive/non-native species	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat fragmentation	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Successional change	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat degradation	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Stream channelization	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**

Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Agricultural/forestry practices	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**3**

11. Other HABITAT threats to the Wildlife in Upland Forest Habitats in Indiana.

1. The Southeastern crowned snake is found in conjunction with upland forested habitats in Indiana, but also prefers sand and siltstone glades.

Total Respondents **1**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Upland Forest Habitats in Indiana identified above.

1. Threats to some wildlife species habitat include invasive species encroachment and habitat destruction.

Total Respondents **1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Upland Forest Habitats in Indiana?

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

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Upland Forest Habitats in Indiana?

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Upland Forest Habitats in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

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

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Upland Forest Habitats in Indiana?

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

17. Regional or local state agency monitoring for the Wildlife in Upland Forest Habitats in Indiana.

1. The DNR occasionaly monitors this species.

Total Respondents **1**

18. Regional or local monitoring by other organizations for the Wildlife in Upland Forest Habitats in Indiana.

1. The nature conservancy occasionaly montiors for this species.

Total Respondents **1**

19. Please list organizations that are monitoring the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

20. What are the current monitoring techniques for the Wildlife in Upland Forest Habitats in Indiana?

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

Trapping (by any technique)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Representative sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**12**

21. Other monitoring techniques for the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

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

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Upland Forest Habitats in Indiana?

1. I would recommend the use of professional surveys and test the effectiveness of cover objects for "trapping" this species.

Total Respondents	**1**

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

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

Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	**0**
		Total Respondents	**3**

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

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Upland Forest Habitats in Indiana?

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Upland Forest Habitats in Indiana?

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Upland Forest Habitats in Indiana.

1. I am not sure how often state agencies survey the crowned snakes habitat. The division of nature preserves monitors these habitats.

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Upland Forest Habitats in Indiana.

1. Nature Conservancy and IDNR nature preserves.

Total Respondents **1**

30. If a technique is not applicable to the Wildlife in Upland Forest Habitats do not select a response in that row.

	Frequently used	**Occasionally used**	**Not used but possible with existing technology and data**	**Not used and not possible with existing technology and data**	**Not economically feasible**	**Unknown**	**Response Total**
GIS mapping	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Aerial							

photography and analysis							
Systematic sampling	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**2**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Upland Forest Habitats in Indiana.

1. I believe this habitat "siltstone glade in upland forest" is monitored through surveys preformed in this habitat.

Total Respondents **1**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Upland Forest Habitats in Indiana?

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

33. What is the current body of science for the Wildlife in Upland Forest Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**0**	**0%**
Inadequate	**1**	**100%**
Nonexistent	**0**	**0%**

Other (please explain below)	0	0%
	Total Respondents	1

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

		Response Total	Response Percent
Title	Amphibians and Reptiles of Indiana	1	100%
Author	Minton	1	100%
Date	2001	1	100%
Publisher	Indiana Academy of Science	1	100%
	Total Respondents		1

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

		Response Total	Response Percent
Title	Snakes of the United States and Canada	1	100%
Author	Ernst and Ernst	1	100%
Date	2003	1	100%
Publisher	Smithsonian Institute	1	100%
	Total Respondents		1

36. What is the current HABITAT body of science for the Wildlife in Upland Forest Habitats in Indiana?

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

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

		Response Total	Response Percent

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

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

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

39. What are the research needs for the Wildlife in Upland Forest Habitats in Indiana?

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

40. Other research needs for the Wildlife in Upland Forest Habitats in Indiana.

1. General life history information is needed for the Southeastern crowned snake in Indiana. Due to this species secretive nature, little is known about Indiana's populations.

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Upland Forest Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

43. How well do the following conservation efforts address the threats to the Wildlife in Upland Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Threats reduction	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Native predator control	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Exotic/invasive species control	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Public education to reduce human disturbance	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**16**

44. Other current conservation practices for the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Upland Forest Habitats in Indiana?

1. Habitat protection and research of general life history requirements.

Total Respondents **1**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Upland Forest Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat protection on public lands	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat protection incentives (financial)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat restoration through regulation	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat restoration on public lands	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Habitat restoration incentives (financial)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**

Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Succession control (fire, mowing)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Corridor development/protection	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Managing water regimes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Pollution reduction	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Protection of adjacent buffer zone	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Restrict public access and disturbance	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Land use planning	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Technical assistance	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Cooperative land management agreements (conservation easements)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents	**0**
					(skipped this question)	1

47. Other current HABITAT conservation practices for the Wildlife in Upland Forest Habitats in Indiana.

No responses were entered for this question.

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

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Upland Forest Habitats in Indiana?

No responses were entered for this question.

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

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

No responses were entered for this question.

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

Appendix E-46: Urban

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

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

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
High sensitivity to pollution	0% (0)	17% (1)	0% (0)	17% (1)	50% (3)	17% (1)	**6**
Bioaccumulation of contaminants	0% (0)	17% (1)	0% (0)	0% (0)	67% (4)	17% (1)	**6**
Predators (native or domesticated)	0% (0)	0% (0)	17% (1)	0% (0)	83% (5)	0% (0)	**6**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	50% (3)	33% (2)	17% (1)	0% (0)	**6**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Species over population	0% (0)	0% (0)	17% (1)	17% (1)	67% (4)	0% (0)	**6**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	0% (0)	**6**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	0% (0)	17% (1)	67% (4)	17% (1)	**6**
					Total Respondents		**66**

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

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	17% (1)	17% (1)	67% (4)	0% (0)	**6**
Habitat loss (feeding/foraging areas)	0% (0)	17% (1)	17% (1)	0% (0)	67% (4)	0% (0)	**6**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Large home range requirements	0% (0)	0% (0)	17% (1)	0% (0)	83% (5)	0% (0)	**6**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	17% (1)	0% (0)	83% (5)	0% (0)	**6**
Degradation of movement/migration routes	0% (0)	0% (0)	17% (1)	17% (1)	67% (4)	0% (0)	**6**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	0% (0)	**6**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	20% (1)	80% (4)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
					Total Respondents		**63**

8. Other threats to the Wildlife in Generalist Habitat in Indiana.

1. Urban sprawl, the attendant loss of habitat and added roads, traffic and human interference.

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

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

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

Total Respondents **4**

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

1. Coyotes are highly adaptable and are seemingly expanding their numbers across the state. People are generally "anti-coyote" fearing predation on pets, livestock and wildlife.

2. The species in Generalist habitats faces few if any threats.

3. As above

4. As 8 above

5. Exclusion of maternity colonies from buildings

Build-up of dense urban development around roost location without adequate greenspace for foraging.

6. As 8 above

Total Respondents **6**

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

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**

Commercial or residential development (sprawl)	0% (0)	33% (2)	0% (0)	17% (1)	50% (3)	0% (0)	**6**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	20% (1)	20% (1)	0% (0)	60% (3)	**5**
Invasive/non-native species	0% (0)	0% (0)	0% (0)	17% (1)	67% (4)	17% (1)	**6**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	17% (1)	17% (1)	50% (3)	17% (1)	**6**
Habitat fragmentation	0% (0)	0% (0)	0% (0)	50% (3)	50% (3)	0% (0)	**6**
Successional change	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Habitat degradation	0% (0)	0% (0)	33% (2)	17% (1)	50% (3)	0% (0)	**6**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Stream channelization	0% (0)	0% (0)	17% (1)	0% (0)	67% (4)	17% (1)	**6**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Agricultural/forestry practices	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Residual contamination (persistent toxins)	0% (0)	0% (0)	17% (1)	17% (1)	50% (3)	17% (1)	**6**
Point source pollution (continuing)	0% (0)	0% (0)	17% (1)	17% (1)	50% (3)	17% (1)	**6**
Mining/acidification	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	0% (0)	**6**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Unknown	0% (0)	0% (0)	0% (0)	20% (1)	0% (0)	80% (4)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
					Total Respondents		**95**

11. Other HABITAT threats to the Wildlife in Generalist Habitat in Indiana.

1. In question #10, the participant has to speculate about the meaning of successional change. Is a "change" an increase or decrease in early or late successional habitats? Climate change also is speculative. Agriculture/Forestry practices have different effects. Grouping these practices into one category does not appropriately represent the individual practice.

2. In question #10, the participant has to speculate about the meaning of successional change. Is a "change" an increase or decrease in early successional habitats? Climate change also is speculative. Agriculture/Forestry practices may have different effects. Grouping these practices into a single category does not appropriately represent each individual practice.

3. In question #10, the participant has to speculate about the meaning of successional change. Is a "change" an increase or decrease in early successional habitats? Climate change also is speculative. Agriculture/Forestry practices have different effects. Grouping these practices into a single category does not appropriately represent each individual practice.

Total Respondents **3**

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

1. 1) Urban sprawl
2) Ag/Forestry (mostly ag)

Total Respondents **1**

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

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (6)	**6**
Statewide once a year monitoring conducted by state agencies	33% (2)	67% (4)	**6**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (6)	**6**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	17% (1)	83% (5)	**6**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (6)	**6**
Regional or local once a year monitoring conducted by state agencies	33% (2)	67% (4)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (6)	**6**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	17% (1)	83% (5)	**6**
		Total Respondents	**48**

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

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (6)	**6**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (6)	**6**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (6)	**6**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	17% (1)	83% (5)	**6**

Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (6)	**6**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (6)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (6)	**6**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	17% (1)	83% (5)	**6**
		Total Respondents	**48**

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

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Statewide once a year monitoring conducted by state agencies	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	17% (1)	0% (0)	67% (4)	17% (1)	**6**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	17% (1)	0% (0)	67% (4)	17% (1)	**6**
				Total Respondents		**48**

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

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	**6**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	**6**

Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	**6**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	17% (1)	0% (0)	17% (1)	67% (4)	**6**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	**6**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (2)	67% (4)	**6**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	17% (1)	0% (0)	17% (1)	67% (4)	**6**
					Total Respondents	**48**

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

1. The only monitoring I know of for coyotes is the furharvest report and they might be included on small game harvest questionaires.

2. statewide

3. Indiana Division of Fish and Wildlife. Population monitoring efforts at the state, regional and local scales are occurring to obtain annual population trends but they are not habitat specific nor do they encompass all habitat types associated with generalist species.

4. State Rabies Lab
DNR monitoring records for bat mistnet captures

Total Respondents **3**

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

Indiana State University- most recently by John O. Whitaker, Jr. (Public survey soliciting for information on known bat locations)

Total Respondents **1**

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

1. There may be some informal monitoring by Farm Bureau or other agricultural groups but if so, it would probably be to prove there are too many.

2. IDNR

3. Indiana Division of Fish and Wildlife. IDF&W uses professional surveys to monitor annual population trends at the state, regional and local scales. However, monitoring is not a means to associate opossum activity with particular habitats, as inferred in the questionnaire.

4. Indiana Division of Fish and Wildlife. IDF&W uses a road-kill survey to monitor annual trends in raccoon populations at the state, regional and local scales. However, monitoring is not a means to associate raccoon activity with particular habitats, as inferred on the questionnaire.

Total Respondents **4**

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

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

Total Respondents 21

21. Other monitoring techniques for the Wildlife in Generalist Habitat in Indiana.

1. coyote "howling" counts

Reports of coyote depredation on pets or livestock

2. IDF&W uses professional survey/census to monitor annual population trends but, here again, it is not means to associate raccoon activity within all generalist habitat types.

Total Respondents 2

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

1. Harvest information
Depredation information

2. IDF&W uses Harvest Reports and Professional Surveys. However, these techniques are not habitat specific nor do they cover the full spectrum of habitats associated with generalist species.

3. IDF&W uses Harvest Reports and Professional Surveys. However, these techniques are not habitat specific nor do they cover the full spectrum of habitats associated with generalist species.

4. Mark-Recapture monitoring of representative colonies across the state.

Survey a sample of Indiana residents every 10 years as to whether they have bats in their home. (Follow-up affirmative responses with a visit to confirm species)

Total Respondents 4

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

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
Regional or local year-round inventory and assessment	0% (0)	100% (5)	**5**

conducted by state agencies			
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (5)	**5**
		Total Respondents	**40**

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

	Yes, these efforts occur	**No effort that I'm aware of**	**Response Total**
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (5)	**5**
		Total Respondents	**40**

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

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
				Total Respondents		**40**

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

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total

Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	17% (1)	83% (4)	**5**
					Total Respondents	**40**

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

No responses were entered for this question.

Total Respondents **0**

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

No responses were entered for this question.

Total Respondents **0**

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

No responses were entered for this question.

Total Respondents **0**

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

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

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	0% (0)	20% (1)	0% (0)	0% (0)	80% (4)	**5**
Aerial photography and analysis	0% (0)	0% (0)	20% (1)	0% (0)	0% (0)	80% (4)	**5**
Systematic sampling	0% (0)	0% (0)	20% (1)	0% (0)	0% (0)	80% (4)	**5**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	**5**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	**5**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	**5**
Participation in landuse programs	20% (1)	0% (0)	0% (0)	0% (0)	0% (0)	80% (4)	**5**
Modeling	0% (0)	0% (0)	20% (1)	0% (0)	0% (0)	80% (4)	**5**
Voluntary landowner reporting	0% (0)	20% (1)	20% (1)	0% (0)	0% (0)	60% (3)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
					Total Respondents		**49**

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

No responses were entered for this question.

Total Respondents **0**

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

GIS mapping or examination of aerial photos

Total Respondents **1**

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

		Response Total	Response Percent
Complete, up to date and extensive		1	17%
Adequate		1	17%
Inadequate		1	17%
Nonexistent		0	0%
Other (please explain below)	1. There is very little habitat specific research on coyotes in IN. Particularly when generalizing across generalist habitat types. 2. I am not aware of any opossum literature as it pertains to generalist habitats in Indiana. 3. Literature focuses on rural, as opposed to urban, areas and therefore does not encompass all the habitats used by generalist.	3	50%
	Total Respondents		6

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

		Response Total	Response Percent
Title	1. Mammels of Indiana 2. Ecology of coyotes as influenced by landscape fragmentation 3. Raccoon density, home range, and habitat use on south-central Indiana farmland.	3	100%
Author	1. Mumford/Whitaker 2. Todd Attwood 3. Larry Lehman	3	100%
Date	1. 1982 2. May 2002 3. 1984	3	100%
Publisher	1. IU Press 2. Purdue University 3. IDF&W	3	100%
	Total Respondents		3

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

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

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

		Response Total	Response Percent
Complete, up to date and extensive		1	20%
Adequate		1	20%
Inadequate		0	0%
Nonexistent		0	0%
Other (please explain below)	1. Unknown 2. unknown 3. unknown	3	60%
Total Respondents		5	

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

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

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

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

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

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	6
Distribution and abundance	0% (0)	17% (1)	0% (0)	33% (2)	50% (3)	0% (0)	6
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	17% (1)	17% (1)	67% (4)	0% (0)	6
Threats (predators/competition, contamination)	0% (0)	0% (0)	17% (1)	33% (2)	50% (3)	0% (0)	6
Relationship/dependence on specific habitats	0% (0)	17% (1)	0% (0)	17% (1)	67% (4)	0% (0)	6
Population health (genetic and physical)	0% (0)	17% (1)	33% (2)	33% (2)	17% (1)	0% (0)	6
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	4
					Total Respondents		40

40. Other research needs for the Wildlife in Generalist Habitat in Indiana.

1. The above research needs are at the landscape level not strictly habitat specific.

2. The above research needs are needed on a landscape scale, not habitat specific.

Total Respondents 2

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

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	5
Distribution and abundance (fragmentation)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	5
Threats (land use change/competition,	0% (0)	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	5

contamination/global warming)							
Relationship/dependence on specific site conditions	0% (0)	0% (0)	0% (0)	0% (0)	80% (4)	20% (1)	**5**
Growth and development of individual components of the habitat	0% (0)	0% (0)	0% (0)	0% (0)	80% (4)	20% (1)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
					Total Respondents		**29**

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

No responses were entered for this question.

Total Respondents **0**

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

	Very well	**Somewhat**	**Not at all**	**Not used**	**Unknown**	**Response Total**
Habitat protection (use below for details)	20% (1)	20% (1)	60% (3)	0% (0)	0% (0)	**5**
Population management (hunting, trapping)	40% (2)	60% (3)	0% (0)	0% (0)	0% (0)	**5**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Reintroduction (restoration)	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Food plots	0% (0)	20% (1)	20% (1)	40% (2)	20% (1)	**5**
Threats reduction	0% (0)	0% (0)	20% (1)	20% (1)	60% (3)	**5**
Native predator control	0% (0)	0% (0)	40% (2)	60% (3)	0% (0)	**5**
Exotic/invasive species control	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Regulation of collecting	20% (1)	20% (1)	20% (1)	40% (2)	0% (0)	**5**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Translocation to new geographic range	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Protection of migration routes	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	20% (1)	60% (3)	20% (1)	**5**
Public education to reduce human disturbance	0% (0)	0% (0)	60% (3)	20% (1)	20% (1)	**5**
Culling/selective removal	20% (1)	0% (0)	20% (1)	60% (3)	0% (0)	**5**
Stocking	0% (0)	0% (0)	20% (1)	80% (4)	0% (0)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**

Total Respondents 84

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

No responses were entered for this question.

Total Respondents 0

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

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

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

3. Protect bats as part of historic home preservation.

Further research into how to allow peaceful and safe coexistence between bats and homeowners.

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

Total Respondents 4

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

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Habitat protection on public lands	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Habitat protection incentives (financial)	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Habitat restoration through regulation	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Habitat restoration on public lands	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Habitat restoration incentives (financial)	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	60% (3)	40% (2)	0% (0)	**5**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	60% (3)	20% (1)	20% (1)	**5**
Succession control (fire, mowing)	0% (0)	40% (2)	20% (1)	40% (2)	0% (0)	**5**
Corridor development/protection	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**

Managing water regimes	0% (0)	0% (0)	40% (2)	40% (2)	20% (1)	**5**
Pollution reduction	0% (0)	0% (0)	80% (4)	0% (0)	20% (1)	**5**
Protection of adjacent buffer zone	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	**5**
Restrict public access and disturbance	0% (0)	20% (1)	60% (3)	0% (0)	20% (1)	**5**
Land use planning	0% (0)	0% (0)	60% (3)	20% (1)	20% (1)	**5**
Technical assistance	0% (0)	20% (1)	40% (2)	20% (1)	20% (1)	**5**
Cooperative land management agreements (conservation easements)	0% (0)	40% (2)	40% (2)	0% (0)	20% (1)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
				Total Respondents		**89**

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

No responses were entered for this question.

Total Respondents **0**

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

No responses were entered for this question.

Total Respondents **0**

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

Historical records show that coyotes were present in Indiana in settlement times. Ever since, one of the goals of the residents of the state seemed to be to eliminate them. Poisoning, unregulated hunting, virtually no closed season on hunting/trapping, paying bounties have done little to reduce the population. In fact, some evidence points to an increasing population in spite of all these attempts. About the only real threat to coyotes would be urban sprawl cutting into their numbers or over-population creating an outbreak of mange or disease. Coyotes will be a part of Indiana's wildlife for a long time.

Total Respondents **1**

6. Please rank the following threats to ALL wildlife in ALL Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	5% (1)	14% (3)	29% (6)	19% (4)	29% (6)	5% (1)	**21**
High sensitivity to pollution	0% (0)	0% (0)	5% (1)	29% (6)	14% (3)	52% (11)	**21**
Bioaccumulation of contaminants	0% (0)	5% (1)	19% (4)	14% (3)	19% (4)	43% (9)	**21**
Predators (native or domesticated)	0% (0)	14% (3)	19% (4)	38% (8)	14% (3)	14% (3)	**21**
Dependence on other species (mutualism, pollinators)	0% (0)	5% (1)	5% (1)	15% (3)	55% (11)	20% (4)	**20**
Diseases/parasites (of the species itself)	0% (0)	5% (1)	5% (1)	30% (6)	30% (6)	30% (6)	**20**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	5% (1)	10% (2)	67% (14)	19% (4)	**21**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	81% (17)	19% (4)	**21**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	10% (2)	19% (4)	14% (3)	33% (7)	24% (5)	**21**
Unregulated collection pressure	0% (0)	0% (0)	5% (1)	10% (2)	76% (16)	10% (2)	**21**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	10% (2)	29% (6)	19% (4)	24% (5)	19% (4)	**21**
					Total Respondents		

7. Please also rank these threats to ALL wildlife in ALL Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	48% (10)	29% (6)	14% (3)	5% (1)	5% (1)	0% (0)	**21**
Habitat loss (feeding/foraging areas)	43% (9)	33% (7)	14% (3)	5% (1)	5% (1)	0% (0)	**21**
Small native range (high endemism)	5% (1)	0% (0)	21% (4)	11% (2)	53% (10)	11% (2)	**19**
Near limits of natural geographic range	0% (0)	5% (1)	10% (2)	24% (5)	57% (12)	5% (1)	**21**
Large home range requirements	0% (0)	0% (0)	19% (4)	19% (4)	48% (10)	14% (3)	**21**
Viable reproductive population size or availability	5% (1)	10% (2)	10% (2)	24% (5)	33% (7)	19% (4)	**21**
Specialized reproductive behavior or low reproductive rates	0% (0)	10% (2)	10% (2)	14% (3)	57% (12)	10% (2)	**21**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	19% (4)	14% (3)	19% (4)	33% (7)	14% (3)	**21**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	75% (15)	25% (5)	**20**
Unknown	0% (0)	0% (0)	12% (1)	12% (1)	17% (2)	67% (8)	**12**
Other (please specify below)	0% (0)	10% (1)	0% (0)	10% (1)	0% (0)	80% (8)	**10**
					Total Respondents		

8. Other threats to ALL wildlife in ALL Grassland Habitats in Indiana.

- Changes in burrowing crayfish or rodent populations that would impact the availability of burrows.
- Introduction of fish into formally fishless breeding waters.
- Development of barriers between the Crayfish frog's burrow and breeding waters.
- Cold wet weather when first litters appear (Late March and early April)
- Cottontail numbers are proportional to available habitats. To increase or decrease in number, depends on available habitats. Agricultural policy i.e. production without supply side considerations influence the availability of the habitats. Cottontails are a game species and utilized heavily as a recreational resource and is therefore a luxury. The tradeoff concerning the cottontail is that we the American public, want beef, corn and related foodstuffs at a low cost. The cottontail will not prevail here as being necessary under those societal needs!
- Habitat loss to natural succession is a critical threat to cottontail populations in Indiana.
- The impacts of herbicides and pesticides drifting over from nearby agricultural lands in unknown.
- Mowing in June, July and August.
- Early harvesting of hay crops.
- Fire suppression.
- Fire suppression is a major threat to many, many species in the state. Savanna habitats are seriously degraded because fire suppression has allowed shade tolerant species to dominate the understory, changing the open savanna structure into a dense forest with an impenetrable understory. Fire keeps the structure open and results in a varied mosaic of habitats, including fire killed trees which provide both food and shelter.

Total Respondents **8**

9. Please briefly describe the top two threats to ALL wildlife in ALL Grassland Habitats in Indiana identified above.

- Land use changes or other factors that impact the availability and persistence of suitable burrows.
- Introduction of fish into formally fishless breeding waters and the development of barriers between the Crayfish frog's burrow and breeding waters.
- Loss of habitat is probably the only threat to some wildlife species, plus people trying to remove them from their lawns and gardens.
- Loss of grasslands, and grassland ground squirrel populations.
  Fragmentation of habitat.
- Invasive/non-native vegetative species such as fescue do not provide cover, nutrition and are thought to be toxic.
  Habitat loss to uncontrolled vegetative succession is a serious threat.
- Agricultural policy.
- Domestic predators.
- Habitat loss to agriculture and natural succession.
- Habitat Loss in this relatively specialized habitat is the primary threat to the short-tailed shrew. Early successional grassland habitats provides marginal habitat requirements for this specialized species. The short-tailed shrew is an insectivore/vermivore. Early successional grassland habitat occurs in abandoned land associated with either agricultural, industrial or urban land uses. Only is isolated situations do grasslands develop as a dominate habitat type in Indiana. Most grasslands will eventually be dominated by shrub or tree cover. By definition early successional grassland habitat is a temporary habitat type.
- The primary threat is the loss of these farm programs. An additional threat would be the loss or shortening of the primary nesting season dates established by the USDA. Mowing or haying during the quail nesting season would be allowed on enrolled acreage if these dates were eliminated or shortened.
- Loss of Quality nesting and brood habitat. Habitat fragmentation.
- Lack of large areas in native grass and mowing during the breeding season.
- Habitat loss and fragmentation create small, isolated patches where nest predation and brood parasitism tend to increase.
- The timing and frequency of haying, as well as the cover type (alfalfa) can negatively affect nest success and limit productivity.
- Availability of habitat.
- Mowing grasslands.
- This species is more of an obligate to open areas with scattered dead trees than most Indiana species. Outright loss of this habitat configuration is probably the leading threat to the Red-headed Woodpecker. West Nile Virus is probably currently the second greatest threat.
- Fire suppression. See above.
- Populations seem to be in steep decline due to habitat fragmentation (from landuse change and inappropriate management – eg – fire suppression). Most known populations seem to occur at such low densities that mating seems a remote possiblility. All the problems associated with small population size and low reproductive rate seem likely to plague the Ornate box turtle. Most populations seem likely to be in a slow-motion death spiral at the moment.

Total Respondents **15**

10. Please rank the following threats to the HABITAT of ALL wildlife in ALL Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	29% (6)	29% (6)	24% (5)	14% (3)	5% (1)	0% (0)	**21**
Counterproductive financial incentives or regulations	5% (1)	15% (3)	20% (4)	10% (2)	15% (3)	35% (7)	**20**
Invasive/non-native species	10% (2)	14% (3)	19% (4)	14% (3)	24% (5)	19% (4)	**21**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	5% (1)	33% (7)	24% (5)	38% (8)	**21**
Habitat fragmentation	29% (6)	33% (7)	14% (3)	5% (1)	14% (3)	5% (1)	**21**
Successional change	25% (5)	40% (8)	10% (2)	15% (3)	5% (1)	5% (1)	**20**
Diseases (of plants that create habitat)	0% (0)	5% (1)	5% (1)	10% (2)	43% (9)	38% (8)	**21**
Habitat degradation	29% (6)	29% (6)	33% (7)	5% (1)	5% (1)	0% (0)	**21**
Climate change	0% (0)	6% (1)	6% (1)	6% (1)	29% (5)	53% (9)	**17**
Stream channelization	0% (0)	0% (0)	0% (0)	25% (5)	60% (12)	15% (3)	**20**
Impoundment of water/flow regulation	0% (0)	0% (0)	5% (1)	15% (3)	70% (14)	10% (2)	**20**
Agricultural/forestry practices	25% (5)	35% (7)	5% (1)	29% (5)	0% (0)	10% (2)	**20**
Residual contamination (persistent toxins)	0% (0)	10% (2)	5% (1)	15% (3)	15% (3)	55% (11)	**20**
Point source pollution (continuing)	0% (0)	5% (1)	0% (0)	19% (4)	19% (4)	57% (12)	**21**
Mining/acidification	5% (1)	0% (0)	14% (3)	10% (2)	43% (9)	29% (6)	**21**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	19% (4)	5% (1)	52% (11)	24% (5)	**21**
Unknown	0% (0)	0% (0)	18% (2)	9% (1)	9% (1)	64% (7)	**11**
Other (please specify below)	14% (1)	0% (0)	14% (1)	0% (0)	0% (0)	71% (5)	**7**

Total Respondents

11. Other HABITAT threats to ALL wildlife in ALL Grassland Habitats in Indiana.

- Mowing or burning for aresthetic purposes such that badger prey population or badger cover are diminished.
- No financial incentive to develop/maintain/manage these habitats.
- If the farm bill programs (e.g. CRP) were to be eliminated the negative effects on Indiana's northern bobwhite population would be substantial.
- Loss of disturbance regimes that maintained the open structure of savannas (and swamp-forests) where the Red-headed Woodoecker resides.
- Fire suppression is the major threat. Lack of fire also results in an increase of shade-tolerant invasive species like garlic mustard and Asian bush honeysuckle, further degrading the savanna habitat.

Total Respondents **5**

12. Please briefly describe the top two HABITAT threats to ALL wildlife in ALL Grassland Habitats in Indiana identified above.

- Cattle grazing, farming, and development activities that affect the persistence of burrows in formally flooded or moist grasslands.
- Draining of breeding ponds, ditche etc. or introduction of fish into breeding waters.
- Loss of grasslands, and grassland groundsquirrel populations.
- Fragmentation of habitat.
- Successional change results in habitat degredation as grasslands are invaded by woody vegetation.
- Agricultural policy.
- Competing products (food).
- I believe invasion of early successional grasslands by tall fescue is probably the top threat followed closely by successional change.
- Succession of the grassland habitat is a major threat if mid-contract activies are not performed. Another threat is mowing or haying during the primary nesting season. These activities are not currently allowed until after July 15 but mowing during late July and early August still destroys some nests and young.
- Habitat Fragmentation & Urban sprawl. Clean Farming.
- Loss of large areas of warm season grasses and early mowing/haying.
- Conversion of hayfields to row-crop or urban cover types.
- Frequent haying, mowing, or over-grazing (though some disturbance is necessary every 1-5 years to maintain the proper vegetation structure).
- Mowing during breeding season.
- Conversion of grasslands to row-crops or housing developments.
- Conversion of savanna to agricultural and development uses.
- Loss of open structure in existing savannas due to loss of disturbances such as fire.
- Fire suppression is resulting in successional change to more shade-tolerant forests. Forestry practices are not emphasizing the need for fire in savanna areas enough.
- Fragmentation and small habitat size – most habitats are small remnants of native grassland, surrounded by either agriculture of fire-suppressed oak savanna. Habitat size needs to be expanded at sites which support seemingly salvageable populations of the Ornate box turtle
- Much potentially suitable habitat has been lost though succession to exotic species and oak woodland. This turtle requires expansive open grassland. Lack of habitat management, or in the case of invasive species, because of the purposeful introduction of invasive shrubs, has resulted in open native grassland being lost to shrub land and oak woodland.

Total Respondents **13**

13. What current monitoring efforts by state agencies are you aware of for ALL wildlife in ALL Grassland Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	10% (2)	90% (19)	**21**
Statewide once a year monitoring conducted by state agencies	29% (6)	71% (15)	**21**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	24% (5)	76% (16)	**21**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	14% (3)	86% (18)	**21**
Regional or local year-round monitoring conducted by state agencies	19% (4)	81% (17)	**21**
Regional or local once a year monitoring conducted by state agencies	24% (5)	76% (16)	**21**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	10% (2)	90% (19)	**21**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	20% (4)	76% (16)	**20**
		Total Respondents	167

14. What current monitoring efforts by other organizations are you aware of for ALL wildlife in ALL Grassland Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (20)	**20**
Statewide once a year monitoring conducted by other organizations	20% (4)	80% (16)	**20**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	5% (1)	95% (19)	**20**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	10% (2)	90% (18)	**20**
Regional or local year-round monitoring conducted by other organizations	5% (1)	95% (19)	**20**
Regional or local once a year monitoring conducted by other organizations	15% (3)	85% (17)	**20**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	11% (2)	89% (17)	**19**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	20% (4)	80% (16)	**20**

Total Respondents

15. How crucial are these monitoring efforts by state agencies for the conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	5% (1)	10% (2)	5% (1)	52% (11)	29% (6)	**21**
Statewide once a year monitoring conducted by state agencies	24% (5)	5% (1)	10% (2)	33% (7)	29% (6)	**21**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	5% (1)	14% (3)	10% (2)	33% (7)	38% (8)	**21**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	14% (3)	5% (1)	5% (1)	43% (9)	33% (7)	**21**
Regional or local year-round monitoring conducted by state agencies	10% (2)	0% (0)	0% (0)	52% (11)	38% (8)	**21**
Regional or local once a year monitoring conducted by state agencies	5% (1)	5% (1)	10% (2)	45% (9)	35% (7)	**20**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	5% (1)	5% (1)	5% (1)	43% (9)	43% (9)	**21**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	14% (3)	0% (0)	5% (1)	43% (9)	38% (8)	**21**

Total Respondents

16. How crucial are these monitoring efforts by other organizations for the conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	45% (9)	55% (11)	**20**
Statewide once a year monitoring conducted by other organizations	5% (1)	20% (4)	0% (0)	25% (5)	50% (10)	**20**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	10% (2)	0% (0)	33% (7)	57% (12)	**21**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	10% (2)	0% (0)	33% (7)	57% (12)	**21**
Regional or local year-round monitoring conducted by other organizations	0% (0)	5% (1)	0% (0)	38% (8)	57% (12)	**21**
Regional or local once a year monitoring conducted by other organizations	5% (1)	10% (2)	0% (0)	38% (8)	48% (10)	**21**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	10% (2)	0% (0)	38% (8)	52% (11)	**21**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	5% (1)	15% (3)	0% (0)	35% (7)	45% (9)	**20**
				Total Respondents		

17. Regional or local state agency monitoring for ALL wildlife in ALL Grassland Habitats in Indiana.

- Statewide within the range of Crawfish frogs: he Indiana Amphibian Monitoring Program (IAMP) part of the North American Amphibian Monitoring Program and Frog Watch are conducted annually during the crawfish frog breeding season. The data can be analyzed regionally.
- The Indiana Division of Fish and Wildlife and the Divsion of Nature Preserves maintain data on the occurrence location of road-kill, accidently trapped or other verified human encounters with badgers.
- In the past,I believe the DFW logged rabbit sightings during quail whistle counts.
- DNR property harvest data.
- Annual small game survey of licensed hunters!
- The Indiana Division of Fish and Wildlife conducts a biennial mailing survey to small game hunters to estimate harvest. Additionally, the division conducts and annual spring whistle counts to provide an index to the spring breeding population. However, neither of these methods focus directly on farm bill habitats.
- Interlake Property, Division of Outdoor Recreation ownership.
- Surveys on state properties, and thru efforts such as the Breeding Bird Atlas projects.
- IDNR's Nongame and Endangered Wildlife Program.
- None.
- I am not aware of any concerted monitoring for the Red-headed Woodpecker by state agencies.

Total Respondents 10

18. Regional or local monitoring by other organizations for ALL wildlife in ALL Grassland Habitats in Indiana.

- None known.
- None known.
- Not aware of any!
- The breeding bird survey is conducted by the National Audubon Society and observers counts the number of bobwhites seen along with other bird species. Again this survey is not directly focuses on farm bill habitats.
- BBS routes and work done on Strip mine lands in SW IN, and Big Oaks NWR.
- Breeding Bird Survey routes are scattered throughout the state depending on volunteer participation.
- Local intensive surveys, nest monitoring, or mark-recapture studies.
- Statewide Breeding Bird Survey, May Day Bird Counts, Summer Bird Counts.
- The national Breeding Bird Survey includes routes in Indiana that incorporate sites occupied by the Red-headed Woodpecker. This annual survey will therefore potentially count Red-headed Woodpeckers at a few sites yearly.

Total Respondents 8

19. Please list organizations that are monitoring ALL wildlife in ALL Grassland Habitats in Indiana.

- None known.
- No monitoring done or needed for some wildlife species.
- None known.
- Not aware of any!
- The biennial small game harvest survey is the only method currently being used by the division of fish and wildlife to monitor the statewide rabbit population. I am not aware of any other monitoring occuring in the state.
- I am only aware of the breeding bird survey conducted by the National Audubon Society.
- INDNR, USFWS, TNC, USFS, Indiana State University
- Indiana Academy of Science, Indiana Audubon Society, an local chapters of NAS worked with IDNR to complete.
- Breeding Bird Atlas (1985-1990).
- USGS Bird Banding Lab coordinates BBS
- Universities such as Purdue complete local-level research projects.
- USGS, birding organizations.
- The U.S. Geological Survey in Porter, Indiana has conducted studies of oak savanna birds, including the Red-headed Woodpecker.

Total Respondents **10**

20. What are the current monitoring techniques for ALL wildlife in ALL Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	63% (10)	6% (1)	13% (2)	19% (3)	**16**
Modeling	7% (1)	20% (3)	27% (4)	7% (1)	7% (1)	33% (5)	**15**
Coverboard routes	0% (0)	10% (1)	20% (2)	10% (1)	0% (0)	60% (6)	**10**
Spot mapping	7% (1)	27% (4)	33% (5)	0% (0)	7% (1)	27% (4)	**15**
Driving a survey route	31% (5)	13% (2)	19% (3)	6% (1)	13% (2)	19% (3)	**16**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	33% (5)	27% (4)	0% (0)	7% (1)	0% (0)	33% (5)	**15**
Mark and recapture	0% (0)	31% (5)	44% (7)	0% (0)	7% (1)	19% (3)	**16**
Professional survey/census	13% (2)	50% (8)	19% (3)	0% (0)	6% (1)	13% (2)	**16**
Volunteer survey/census	31% (5)	6% (1)	25% (4)	0% (0)	6% (1)	31% (5)	**16**
Trapping (by any technique)	19% (3)	33% (5)	25% (4)	0% (0)	6% (1)	19% (3)	**16**
Representative sites	7% (1)	21% (3)	14% (2)	0% (0)	7% (1)	50% (7)	**14**
Probabilistic sites	0% (0)	27% (3)	18% (2)	0% (0)	0% (0)	55% (6)	**11**
Other (please specify below)	0% (0)	17% (1)	0% (0)	0% (0)	0% (0)	83% (5)	**6**
					Total Respondents		

21. Other monitoring techniques for ALL wildlife in ALL Grassland Habitats in Indiana.

- Sampling for eggs or larva.
- Not aware of any!
- I'm not aware of any bobwhite monitoring that focuses directly on populations in farm bill habitats.
- Nest monitoring.
- Distance sampling.

Total Respondents **4**

22. What one or two monitoring techniques would you recommend for effective conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

- More intensive call surveys and larva surveys, especially to determine how far the adults are traveling to deposit their eggs.
- If we wanted to survey some wildlife species I would develop a system counting hills.
- Continue to monitor road-kills, accidental captures and other verified sightings. Review this data and if warrented (a number of verified sightings near grassland habitat)attempt a telemetry and tracking study.
- Trapping and visual surveys.
- Trapping is expensive and visual surveys are less expensive nd can be combined with other surveys.
- McWheter, Gary Randolph, 1991, Estimating Abudnace of Cottontail Rabbits using live trapping and visual surveys, Master's thesis, University of Tennessee
- Specifically being done for the cottontail is not warranted. However,an analysis of vegetative structure by specie or species group in early successional habitats and then correllated with selected early successional species would be relevant!
- I would like to see a rural mail carrier survey initiated that would be useful for monitoring rabbits and several other wildlife species. Another method to monitor rabbit populations would be to include rabbit observations on the division's annual bobwhite whistle counts.
- To monitor bobwhite populations specificially in farm bill habitats I would suggest selecting a random sample of contracts and conducting flushing transects. Another intensive method would be to have hunters complete "report cards" when hunting on farm bill acreage. A less intensive method would be to request that landowners conduct whistle counts on their enrolled lands each spring.
- Fall Covey counts.
- Professional and Volunteer survey and census.
- Point counts during breeding season.
- Establish more Breeding Bird Survey routes http://www.pwrc.usgs.gov/bbs/.
- Conduct point counts on private lands. If possible estimate nest success too.
- Roadside surveys; spot-mapping on smaller areas.
- Point counts in potential habitats using distance sampling. This technique is relatively simple to implement and provides density information rather than an index. Observers count birds from points randomly located in the studied habitat and measure or estimate distance to observed birds. Calculation of density from the data, however, does require some technical expertise.

  Buckland, S. T., D. R. Anderson, et al. (2001). Introduction to distance sampling. Oxford, UK, Oxford University Press.
- I'm not sure if a salvageable population exists in the State of Indiana. It would be critical to survey know populations to determine population structure, density and potential for recruitment. This information could then be used to plan and implement a conservation effort geared towards the Ornate box turtle.

Total Respondents **14**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for ALL wildlife in ALL Grassland Habitats in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	5% (1)	95% (20)	**21**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (21)	**21**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	10% (2)	90% (19)	**21**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	29% (6)	71% (15)	**21**
Regional or local year-round inventory and assessment conducted by state agencies	5% (1)	95% (20)	**21**
Regional or local once a year inventory and assessment conducted by state agencies	5% (1)	95% (20)	**21**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	5% (1)	95% (20)	**21**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	24% (4)	81% (17)	**21**
		Total Respondents	

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for ALL wildlife in ALL Grassland Habitats in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	10% (2)	90% (19)	**21**
Statewide once a year inventory and assessment conducted by other organizations	14% (3)	86% (18)	**21**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	14% (3)	86% (18)	**21**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	10% (2)	90% (19)	**21**
Regional or local year-round inventory and assessment conducted by other organizations	5% (1)	95% (20)	**21**
Regional or local once a year inventory and assessment conducted by other organizations	10% (2)	90% (19)	**21**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	14% (3)	86% (18)	**21**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	14% (3)	86% (18)	**21**
	Total Respondents		

25. How crucial are these HABITAT efforts by state agencies for the conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	5% (1)	10% (2)	10% (2)	33% (7)	43% (9)	**21**
Statewide once a year inventory and assessment conducted by state agencies	5% (1)	5% (1)	5% (1)	37% (7)	47% (9)	**19**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	5% (1)	15% (3)	5% (1)	30% (6)	45% (9)	**20**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	11% (2)	0% (0)	16% (3)	26% (5)	47% (9)	**19**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	5% (1)	16% (3)	26% (5)	53% (10)	**19**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	11% (2)	5% (1)	32% (6)	38% (10)	**19**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	5% (1)	5% (1)	11% (2)	26% (5)	53% (10)	**19**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	11% (2)	11% (2)	26% (5)	53% (10)	**19**
				Total Respondents		

26. How crucial are these HABITAT efforts by other organizations for the conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	10% (2)	10% (2)	30% (6)	50% (10)	**20**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	10% (2)	10% (2)	30% (6)	50% (10)	**20**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	10% (2)	10% (2)	25% (5)	55% (11)	**20**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	5% (1)	10% (2)	10% (2)	25% (5)	50% (10)	**20**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	10% (2)	30% (6)	60% (12)	**20**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	5% (1)	5% (1)	32% (6)	58% (11)	**19**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	5% (1)	10% (2)	25% (5)	60% (12)	**20**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	10% (2)	10% (2)	25% (5)	50% (11)	**20**
				Total Respondents		

27.	Regional or local state agency HABITAT inventory and assessment for ALL wildlife in ALL Grassland Habitats in Indiana.

- None.
- Crawfish frog habitat is not well understood and is not currently being inventoried to my knowledge. Grasslands may be monitored by not all grasslands are crawfish frog habitat.
- None.
- I believe that Purdue University and the NRCS and perhaps others keep track of grasslands created as part of the Farm Bill Programs. There are also occassional statewide assessments of grassland as part of remote-sensing, GIS based studies such as the GAP Analysis. The Division of Nature Preserves also keeps track of good examples of remnant native grassland. I am not sure any of these agencies collect the grassland habitat data specifically for badgers but other agencies applied the information to badgers.
- DNR property evaluations, but I know of nothing organized!
- I'm not aware of any regularly scheduled assessment of farm bill lands for northern bobwhites.
- Interlake Property.
- Habitats on State areas are occasionally surveyed for quality and quantity.
- Annual and 5-year-census, county-level reports of acreage planted to various hay cover types and acreage harvested.
- None.
- Indiana DNR/DNP has inventoried habitats across the state over the past three decades. Savannas mainly occur in the northern third of the state.

Total Respondents **10**

28. Regional or local HABITAT inventory and assessment by other organizations for ALL wildlife in ALL Grassland Habitats in Indiana.

- None.
- Crawfish frog habitat is not well understood and is not currently being inventoried to my knowledge. Grasslands may be monitored by not all grasslands are crawfish frog habitat.
- None.
- None known.
- There are Farm Bill/CRP type inventories but none done specifically for the Cottontail!
- The Farm Service Agency keeps track of the location and acreage associated with each contract.
- Unknown.
- USFWS, USFWS, TNC, Indiana State University have surveyed quality and quantity of habitats for HESP's.
- statewide aerial imagery of habitats, land uses.
- In the northern third of the state.

Total Respondents 9

29. Please list organizations that are monitoring this HABITAT for ALL wildlife in ALL Grassland Habitats in Indiana.

- None.
- Crawfish frog habitat is not well understood and is not currently being inventoried to my knowledge. Grasslands may be monitored by not all grasslands are crawfish frog habitat.
- None.
- None known.
- None specifically for the Cottontail!
- I am not aware of any scheduled monitoring of early successional habitat in Indiana. I would suspect that one of the universities has remotely sensed data but their objective probably isn't specifically to monitor early successional habitat.
- The Indiana Division of Fish and Wildlife will be initiated some type of bobwhite monitoring program to determine the success of the newest continuous CRP practice (CP33). The Farm Service Agency monitors acreage and location of tracts enrolled in each USDA program. The Natural Resource Conservation Service provides technical support or administers most farm programs and I believe they conduct regular inspections.
- Unknown.
- INDNR, USDA, USFS, TNC, Indiana State University.
- USDA National Agricultural Statistics Service for Indiana http://www.nass.usda.gov/in/
- USDA
- Indiana DNR/DNP, The Nature Conservancy, Chicago Wilderness, U.S. Geological Survey, National Park Service, U.S. Fish and Wildlife Service.

Appendix E-48: Aggregated Grasslands

Total Respondents	**10**

30. What are the current HABITAT inventory and/or assessment techniques for ALL wildlife in ALL Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	17% (3)	28% (5)	22% (4)	0% (0)	0% (0)	33% (6)	**18**
Aerial photography and analysis	17% (3)	28% (5)	22% (4)	0% (0)	0% (0)	33% (6)	**18**
Systematic sampling	0% (0)	18% (3)	29% (5)	0% (0)	0% (0)	53% (9)	**17**
Property tax estimates	0% (0)	0% (0)	6% (1)	6% (1)	6% (1)	83% (15)	**18**
State revenue data	0% (0)	0% (0)	6% (1)	6% (1)	6% (1)	83% (15)	**18**
Regulatory information	0% (0)	6% (1)	6% (1)	6% (1)	6% (1)	78% (14)	**18**
Participation in landuse programs	11% (2)	5% (1)	21% (4)	0% (0)	11% (2)	53% (10)	**19**
Modeling	0% (0)	22% (4)	22% (4)	6% (1)	11% (2)	39% (7)	**18**
Voluntary landowner reporting	0% (0)	6% (1)	11% (2)	0% (0)	17% (3)	67% (12)	**18**
Other (please specify below)	0% (0)	10% (1)	0% (0)	0% (0)	10% (1)	80% (8)	**10**
					Total Respondents		

31. Other HABITAT inventory and assessment techniques for ALL wildlife in ALL Grassland Habitats in Indiana.

- None known.
- None in place, and none needed.
- I recently correlated the number of acres enrolled in USDA programs with our annual bobwhite whistle indices on a statewide scale. I am planning on modeling regional bobwhite indices and USDA idled acreage.

Total Respondents **3**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

- Crawfish frog habitat may be described by a combination of hydrology, soil type, proximity to breeding waters, and vegetation. These factors should be investigated to develop a model for crawfish frog habitat.
- Monitoring of the larger grasslands in Indiana both native and man-made such as the grassland created by stip-minning.
- Especially monitor the quality and quantity of these areas.
- Cottontails are a mid to late early successional habitat resident. We do not know the amount of structure required to maintain optimum populations. We don't know what an optimum population is! We do know that it cycles but we don't know why! That isn't a good answer, I don't know a good answer for that!
- The best habitat inventory technique would be creating a GIS with Landsat data from different time periods.
- Flush counts or more intensive whistle counts on farm program lands would be a useful method of evaluating their quality when compared to the same indices on non-farmbill lands.
- Grassland maping by major plant species type.
- GIS mapping and participation in landuse programs (CRP).
- Survey of hay harvest dates and frequencies each year.
- Aerial imagery couple with modeling.

Total Respondents **9**

33. What is the current body of science for ALL wildlife in ALL Grassland Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	6	33%
Inadequate	10	56%
Nonexistent	2	11%
Other (please explain below)	0	0%
Total Respondents		**18**

Appendix E-48: Aggregated Grasslands

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

Title = Amphibians and reptiles of Indiana
Author = Sherman A. Minton, Jr.
Date = 2001
Publisher = Indiana Academy of Sciences

Title = Mamm. IN
Author = M & W 1982
Date =
Publisher =

Title = Mammals of the Eastern United States
Author = J.O. Whitaker, Jr. and W. J. Hamilton, Jr
Date = 1998
Publisher = Cornell University Press

Title = Population Ecology and Harvest of the Cottontail Rabbit
Author = Heraold A.Demaree, Jr
Date = 1978
Publisher = Indiana DFW

Title = Population ecology and harvest of the cottontail rabbit on the Pigeon River fish and wildlife area, 1962-1970
Author = Harold Demaree Jr.
Date = 1978
Publisher = Indiana Division of Fish and Wildlife

Title = A 14-year study of BLARINA BREVICAUDA in east-central Illinois.
Author = Getz, L. L.
Date = 1989
Publisher = J. Mammalogy 70:58-66.

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

Title = Atlas of Breeding Birds of Indiana
Author = Castrale, JS, E Hopkins, C Keller
Date = 1988
Publisher = IDNR

Title = Red-headed Woodpecker (Melanerpes erythrocephalus). In The Birds of North America, No. 518
Author = Smith, K. G., J. H. Withgott, and P. G. Rodewald.
Date = 2000
Publisher = The Birds of North America, Inc., Philadelphia, PA.

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

www.natureserve.org/explorer

Title = Blarina bravicauda
Author = George,S. B., J. R. Choate, and H. H. Genoways
Date = 1986
Publisher = Mammalian Species 261:1-9

Title = Effects of management practices on grassland birds: Bobolink
Author = Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman and B.R. Euliss
Date = 2001
Publisher = Northern Prairie Wildlife Research Center

Title = BNA Account – Savannah
Author = Wheelwright and Rising
Date = 1993
Publisher = American Ornithologists' Union

Title = 1998. Atlas of Breeding Birds of Indiana Atlas of Breeding Birds of Indiana
Author = Castrale, John S., Edward M. Hopkins, and Charles E. Keller.
Date = 1998
Publisher = Indiana Department of Natural Resources

36. What is the current HABITAT body of science for ALL wildlife in ALL Grassland Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	7	42%
Inadequate	9	53%
Nonexistent	6	1%
Other (please explain below)	0	0%
Total Respondents		17

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

Title = A4-year study study of BLARINA BREVICAUDA un east-central Illinois
Author = Getz, L. L.
Date = 1989
Publisher = J. Mammalogy 70:58-66.

Title = Surviving where ecosystems meet: ecotonal animal communities of midwestern oak savannas and woodlands
Author = Temple, Stanley A.
Date = 1998
Publisher = Transactions of the Wisconsin Academy of Sciences, Arts and Letters 86:206-222

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

Title = Savannas, barrens, and rock outcrop plant communities of North America
Author = Anderson, Roger C., Fralish, James S. , and Baskin, Jerry M.
Date = 1999
Publisher = Cambridge University Press

39. What are the research needs for ALL wildlife in ALL Grassland Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	15% (3)	40% (8)	10% (2)	35% (7)	0% (0)	**20**
Distribution and abundance	10% (2)	20% (4)	30% (6)	10% (2)	30% (6)	0% (0)	**20**
Limiting factors (food, shelter, water, breeding sites)	20% (4)	35% (7)	20% (4)	10% (2)	15% (3)	0% (0)	**20**
Threats (predators/competition, contamination)	15% (3)	20% (4)	35% (7)	10% (2)	20% (4)	0% (0)	**20**
Relationship/dependence on specific habitats	16% (3)	21% (4)	21% (4)	21% (4)	21% (4)	0% (0)	**19**
Population health (genetic and physical)	11% (2)	16% (3)	32% (6)	5% (1)	32% (6)	5% (1)	**19**
Other (please specify below)	0% (0)	30% (3)	0% (0)	0% (0)	30% (3)	40% (4)	**10**
					Total Respondents		

40. Other research needs for ALL wildlife in ALL Grassland Habitats in Indiana.

Some wildlife species are in great need of study on all aspects of its ecology.

We need more information on the reproduction of some wildlife species in various habitats.

The relationship between badgers and land use and soil type, especially soil types that support borrows both for the badger and its prey.

Determine what affect feral cats have on a local cottontail population!

1. I would like to see some research to determine the extent to which mowing and haying negatively impact production following the end of the primary nesting season (as defined by the USDA). Following July 15 in Indiana landowners can mow or hay there enrolled lands. I believe a substantial proportion of bobwhites are still nesting at that time.

2. How to reduce clean farming and increasing field size.

Detailed demographic data need to be gathered and the effects of habitat structure and fragmentation on those demographic parameters understood.

Total Respondents **7**

41. What are the HABITAT research needs for ALL wildlife in ALL Grassland Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	5% (1)	40% (8)	30% (6)	10% (2)	10% (2)	5% (1)	**20**
Distribution and abundance (fragmentation)	20% (4)	30% (6)	35% (7)	5% (1)	10% (2)	0% (0)	**20**
Threats (land use change/competition, contamination/global warming)	16% (3)	32% (6)	26% (5)	0% (0)	26% (5)	0% (0)	**19**
Relationship/dependence on specific site conditions	11% (2)	26% (5)	32% (6)	11% (2)	21% (4)	0% (0)	**19**
Growth and development of individual components of the habitat	5% (1)	16% (3)	32% (6)	11% (2)	32% (6)	5% (1)	**19**
Other (please specify below)	11% (1)	22% (2)	11% (1)	0% (0)	11% (1)	44% (4)	**9**
					Total Respondents		**106**

42. Other HABITAT research needs for ALL wildlife in ALL Grassland Habitats in Indiana.

- Crawfish frog habitat needs to be adequately described.
- Additional information on all phases of the biology of some wildlife species would be helpful. However, others are in no current danger
- The difference between native, warm-season-grass/native for grasslands; planted, non-native, cool-season grasslands; and CRP grasslands relative to suitability for badgers.
- Seeding mixtures and mid-contract management activities currently utilized on farm bill lands need to be evaluated to determine their value to bobwhite nesting and brood rearing.
- How to create and maintain quality grassland habitat on a permanent basis.
- Timing and frequency of haying and other agricultural disturbances.
- Relationship of fire to habitat structure needs to be better elucidated.

Total Respondents **6**

Appendix E-48: Aggregated Grasslands

43. How well do the following conservation efforts address the threats to ALL wildlife in ALL Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	15% (3)	60% (12)	10% (2)	10% (2)	5% (1)	**20**
Population management (hunting, trapping)	16% (3)	11% (2)	16% (3)	53% (10)	5% (1)	**19**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	20% (4)	80% (16)	0% (0)	**20**
Reintroduction (restoration)	0% (0)	0% (0)	15% (3)	80% (16)	5% (1)	**20**
Food plots	5% (1)	15% (3)	20% (4)	55% (11)	5% (1)	**20**
Threats reduction	5% (1)	16% (3)	5% (1)	53% (10)	21% (4)	**19**
Native predator control	0% (0)	21% (4)	11% (2)	55% (11)	11% (2)	**19**
Exotic/invasive species control	15% (3)	25% (5)	10% (2)	35% (7)	15% (3)	**20**
Regulation of collecting	0% (0)	32% (6)	21% (4)	37% (7)	11% (2)	**19**
Disease/parasite management	0% (0)	0% (0)	15% (3)	75% (15)	10% (2)	**20**
Translocation to new geographic range	0% (0)	0% (0)	15% (3)	80% (16)	5% (1)	**20**
Protection of migration routes	5% (1)	10% (2)	10% (2)	60% (12)	15% (3)	**20**
Limiting contact with pollutants/contaminants	0% (0)	10% (2)	10% (2)	55% (11)	25% (5)	**20**
Public education to reduce human disturbance	10% (2)	15% (3)	5% (1)	50% (10)	20% (4)	**20**
Culling/selective removal	0% (0)	0% (0)	10% (2)	75% (15)	15% (3)	**20**
Stocking	0% (0)	0% (0)	15% (3)	80% (16)	5% (1)	**20**
Other (please specify below)	11% (1)	0% (0)	11% (1)	56% (5)	22% (2)	**9**
				Total Respondents		

44. Other current conservation practices for ALL wildlife in ALL Grassland Habitats in Indiana.

- Study burrow making crayfish and their burrows.
- Saving grassland (and woodland) will help this animal.
- Vegetative succession control.
- Provide additional habitats through programs, agricultural and other. Rabbits are a by product of an economy. The more human needs placed on the landscape the less amount of by products will be produced. As I mentioned above: If we select for beef and corn there will be less rabbits. By selecting for you simultaneously select against something else.
- Maybe we need to find out how many steaks we need will determine how many rabbits we have!
- Restoration of native grasslands, and increased enrollment in Conservation Reserve Program provide refuges from
- agricultural disturbances (provided the proper vegetation structure is maintained).
- Fire management in savannahs.
- (Water level management in swamp forests)
- FIRE!!! How can this critical process not be listed as one of the standard conservation practices in your template?

Total Respondents **6**

45. What one or two specific practices would you recommend for more effective conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

- Promote non-disturbance in known crawfish frog habitat.
- Identification of breeding sites and protect the sites from disturbance and the introduction of fish.
- Save natural habitats.
- Conservation and restoration of ground squirrel and pocket gopher populations. Limit human access to all parts of large grasslands.
- Promote early succession associated with structure similar to L. japonica.
- The best strategy would be to protect as much early successional habitat as possible but that habitat must be manipulated periodically to set back natural succession.
- Manage lands for early successional grassland habitat - would require land use change every 3 to 5 years.
- I would require mid-contract management (e.g. disking or burning) between 3-5 years after establishment on all farm bill acreage planted to grasses.
- Permanent protection of grassland habitat.
- Protection of habitat and restoration of habitat.
- Conservation and active management of grassland habitats.
- Restoration of former savanna sites.
- Long-term fire management of existing savanna sites.
- Using prescribed fire to manage savanna habitats is crucial and is not happening on nearly enough acres in the state.
- Restoration of grassland habitats adjacent to known population sites would be a great start. Restoration could involve creation of native grassland system from adjacent agricultural fields, wit the restoration designed to create habitat specifically for this and other species.
- Restoration of oak savanna at known sites would involve opening the canopy in oak woodlands to ~50% cover and control of invasive exotic shrubs. This would restore connectivity between potentially occupied habitat patches at larger public lands, and expand potential habitat.

Total Respondents **13**

46. How well do the following conservation efforts address the HABITAT threats to ALL wildlife in ALL Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	5% (1)	55% (11)	10% (2)	10% (2)	20% (4)	**20**
Habitat protection on public lands	25% (5)	50% (10)	15% (3)	5% (1)	5% (1)	**20**
Habitat protection incentives (financial)	5% (1)	45% (9)	10% (2)	10% (2)	30% (6)	**20**
Habitat restoration through regulation	5% (1)	35% (7)	20% (4)	25% (5)	15% (3)	**20**
Habitat restoration on public lands	20% (4)	50% (10)	15% (3)	0% (0)	15% (3)	**20**
Habitat restoration incentives (financial)	22% (4)	33% (6)	6% (1)	17% (3)	22% (4)	**18**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	15% (3)	15% (3)	60% (12)	10% (2)	**20**
Selective use of functionally equivalent exotic species in place of extirpated natives	5% (1)	15% (3)	20% (4)	55% (11)	5% (1)	**20**
Succession control (fire, mowing)	47% (9)	47% (9)	0% (0)	0% (0)	5% (1)	**19**
Corridor development/protection	10% (2)	35% (7)	10% (2)	35% (7)	10% (2)	**20**
Managing water regimes	0% (0)	5% (1)	37% (7)	47% (9)	11% (2)	**19**
Pollution reduction	0% (0)	5% (1)	11% (2)	47% (9)	35% (7)	**19**
Protection of adjacent buffer zone	0% (0)	44% (8)	6% (1)	33% (6)	17% (3)	**18**
Restrict public access and disturbance	5% (1)	26% (5)	16% (3)	32% (6)	21% (4)	**19**
Land use planning	6% (1)	23% (4)	17% (3)	39% (7)	17% (3)	**18**
Technical assistance	5% (1)	35% (7)	5% (1)	21% (4)	32% (6)	**19**
Cooperative land management agreements (conservation easements)	16% (3)	35% (7)	5% (1)	16% (3)	26% (5)	**19**
Other (please specify below)	13% (1)	0% (0)	0% (0)	13% (1)	75% (6)	**8**
				Total Respondents		**336**

47. Other current HABITAT conservation practices for ALL wildlife in ALL Grassland Habitats in Indiana.

- Strip spraying/interseeding.
- Preventing the early mowing/haying of CRP land or other habitat.
- I apologize - I finally found fire in the list!

Total Respondents **3**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of ALL wildlife in ALL Grassland Habitats in Indiana?

- Public ownership (purchase) of know crawfish frog habitat and maintenance of the hydrology of the site and associated breeding waters.
- Grassland often have to be maintained by fire. Control-burns are becoming more difficult to conduct due to lack of trained personnel, restricted burn windows, and encroaching development. Grassland management difficulties need to be addressed.
- Prescribed burning, becuase it is useful in controlling vegetative succession. Uncontrolled vegetative succession eventually excludes rabbits and makes future management difficult due to concerns for the Indiana Bat.
- Stribling, H.L. and Speake, D. W. 1991. Responses of Bobwhie WQuail and EAstern Cottontail Rabbit Populations to Prescribed Burning, Cover Enhancement and Food Plots. Alabama Game & Fish Divison/Auburn University.
- Maintenance of early sucessional components!
- Successional control is the best method to maintail useable rabbit habitat.
- Early successional grassland habitat maintenance would require "restart succession is areas. Disturbance of a magnitude to create bare ground, such as a complete burn, plowing, etc. would be required to accomplish this goal.
- Making mid-contract management mandatory on enrolled acreage.
- Protection/restoration of habitat and preventing early mowing/haying.
- Provide incentives to prevent landowners from haying or grazing during the breeding season.
- Educate landowners about the importance of their land to the persistence of wildlife species.
- Incentives for conserving and managing grasslands.
- Purchase of remnant savannas, restoration of savannas that have undergone succession to forest or have been farmed.
- Burn more. And get rid of the invasive species degrading savanna habitats, including those invasive species deliberately plant by wildlife agencies.

Total Respondents **12**

49. Do you have any additional comments or information on ALL wildlife in ALL Grassland Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

- Research needs to be conducted and management information developed for public land managers and private land owners (education) for very under-studied wildlife species.
- This is a common animal in grassy fields and also in woods. It is doing fine at present, so nothing is needed. Off the subject I wondered why you left off such species as the shrews Sorex hoyi and S. fumeus.
- No!
- A substantial proportion of Indiana's non-farm program early successional habitat has been lost over the last 30 years and the farm bill grasslands now constitute a substantial proportion of the bobwhites habitat in the state.
- I think we know what needs to be completed but the question is how to get the Private landownership to practice what is needed on a large scale.
- CRP has been beneficial for HESP's in Indiana. We need to continue to encourage incentives to private landowners to keep land in grassland habitat that is beneficial to HESP's.
- Bobolinks may disperse from breeding sites in response to nest failure. Two spatially separated populations may be demographically linked by dispersal, so what happens on one field may affect birds on another field. Although the dispersal ability of the species has not been well-quantified, its at least on the scale of a county, if not multiple counties. Management and conservation should occur at these larger spatial scales. Managing a network of different grassland types using different disturbance regimes so that some populations nest successfully every year could provide a balance between agricultural production and Bobolink production.
- In many ways, savanna is a mixture of forest and grassland habitats so conserving those habitat types will aid savanna species. However, there are species, such as the Red-headed Woodpecker, that specifically benefit from oak savanna. Understanding the conservation value, for different species, of habitats along the grassland-forest gradient can help guide our allocation of resources to produce different landscape compositions.
- This is the last one I'll have time to do and I'd like to add some general comments.
  The unfortunate reality is that the biggest legacy of wildlife biologists in Indiana is the list of invasive species they have unleashed on this state. Asian bush honeysuckle, Japanese honeysuckle, multiflora rose, autumn olive - this list goes on and on. Where is the accountability for the incredible damage these species are now causing to wildlife in the state? Where is the effort to undo this damage? For those of us spending hundreds of thousands of dollars each year to control these species so that we can provide wildlife habitat in Indiana it is very disheartening to have no wildlife biologists step up and admit those species were a mistake and work alongside us to control these problems. And the phrase "Selective use of functionally equivalent exotic species in place of extirpated natives" may be the most insulting statement I've ever read. That is the whole problem with wildlife biology in this state - they think that statement makes sense!! It is time for biologists to join all the other natural resource managers on this issue.
- The Ornate box turtle is too often taken for granted on managed lands. Populations that were once among the best in the state may be senescent or extinct due to loss or inappropriate management of habitat. Loss of early successional native grasslands, due to uncontrolled succession or invasion of purposefully introduced invasive shrubs, are the likely culprits. This species needs to be explicitly incorporated into management plans for public lands where it still persists.

Total Respondents **10**

6. Please rank the following threats to the Wildlife in Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	0% (0)	25% (2)	25% (2)	38% (3)	12% (1)	**8**
High sensitivity to pollution	0% (0)	0% (0)	0% (0)	38% (3)	12% (1)	50% (4)	**8**
Bioaccumulation of contaminants	0% (0)	0% (0)	25% (2)	12% (1)	12% (1)	50% (4)	**8**
Predators (native or domesticated)	0% (0)	0% (0)	12% (1)	25% (2)	38% (3)	25% (2)	**8**
Dependence on other species (mutualism, pollinators)	0% (0)	12% (1)	12% (1)	0% (0)	63% (5)	12% (1)	**8**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	14% (1)	14% (1)	43% (3)	26% (2)	**7**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	12% (1)	75% (6)	12% (1)	**8**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	88% (7)	12% (1)	**8**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	12% (1)	12% (1)	50% (4)	25% (2)	**8**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	12% (1)	75% (6)	12% (1)	**8**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	25% (2)	12% (1)	38% (3)	25% (2)	**8**
					Total Respondents		**88**

7. Please also rank these threats to the Wildlife in Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	25% (2)	25% (2)	25% (2)	12% (1)	12% (1)	0% (0)	**8**
Habitat loss (feeding/foraging areas)	25% (2)	38% (3)	12% (1)	12% (1)	12% (1)	0% (0)	**8**
Small native range (high endemism)	14% (1)	0% (0)	14% (1)	14% (1)	43% (3)	14% (1)	**7**
Near limits of natural geographic range	0% (0)	12% (1)	12% (1)	25% (2)	38% (3)	12% (1)	**8**
Large home range requirements	0% (0)	0% (0)	25% (2)	25% (2)	38% (3)	12% (1)	**8**
Viable reproductive population size or availability	0% (0)	12% (1)	0% (0)	0% (0)	63% (5)	25% (2)	**8**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	25% (2)	12% (1)	50% (4)	12% (1)	**8**
Degradation of movement/migration routes	0% (0)	12% (1)	12% (1)	25% (2)	38% (3)	12% (1)	**8**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	88% (6)	12% (1)	**7**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Other (please specify below)	0% (0)	25% (1)	0% (0)	0% (0)	0% (0)	75% (3)	**4**
					Total Respondents		**79**

8. Other threats to the Wildlife in Grassland Habitats in Indiana.

1. 1. Changes in burowing crayfish or rodent populations that would impact the availability of burrows.
   2. Introduction of fish into formally fishless breeding waters.
   3. Development of barriers between the Crayfish frog's burrow and breeding waters.

Total Respondents **1**

9. Please briefly describe the top two threats to the Wildlife in Grassland Habitats in Indiana identified above.

1. Land use changes or other factors that impact the availability and persistence of suitable burrows.
2. Introduction of fish into formally fishless breeding waters and the development of barriers between the Crayfish frog's burrow and breeding waters.

loss of habitat is probably the only threat to some wildlife species, plus people trying to remove from thier lawns and gardens.

1. Loss of grasslands, and grassland groundsquirrel populations.
2. Fragmentation of habitat.

Total Respondents **3**

10. Please rank the following threats to the HABITAT of the Wildlife in Grassland Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	12% (1)	50% (4)	12% (1)	12% (1)	12% (1)	0% (0)	**8**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	25% (2)	0% (0)	12% (1)	63% (5)	**8**
Invasive/non-native species	0% (0)	0% (0)	12% (1)	25% (2)	25% (2)	38% (3)	**8**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	25% (2)	50% (4)	25% (2)	**8**
Habitat fragmentation	12% (1)	50% (4)	12% (1)	12% (1)	12% (1)	0% (0)	**8**
Successional change	0% (0)	43% (3)	0% (0)	29% (2)	14% (1)	14% (1)	**7**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	63% (5)	38% (3)	**8**
Habitat degradation	0% (0)	25% (2)	50% (4)	13% (1)	13% (1)	0% (0)	**8**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	60% (3)	40% (2)	**5**

Stream channelization	0% (0)	0% (0)	0% (0)	43% (3)	43% (3)	14% (1)	**7**
Impoundment of water/flow regulation	0% (0)	0% (0)	14% (1)	14% (1)	57% (4)	14% (1)	**7**
Agricultural/forestry practices	0% (0)	57% (4)	0% (0)	29% (2)	0% (0)	14% (1)	**7**
Residual contamination (persistent toxins)	0% (0)	14% (1)	0% (0)	14% (1)	14% (1)	57% (4)	**7**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	25% (2)	25% (2)	50% (4)	**8**
Mining/acidification	12% (1)	0% (0)	12% (1)	12% (1)	50% (4)	12% (1)	**8**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	12% (1)	12% (1)	50% (4)	25% (2)	**8**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
Other (please specify below)	0% (0)	0% (0)	25% (1)	0% (0)	0% (0)	75% (3)	**4**
					Total Respondents		**127**

11. Other HABITAT threats to the Wildlife in Grassland Habitats in Indiana.

Mowing or burning for aresthetic purposes such that badger prey population or badger cover are diminished.

Total Respondents **1**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Grassland Habitats in Indiana identified above.

1. Cattle grazing, farming, and development activities that affect the persistence of burrows in formally flooded or moist grasslands.
2. Draining of breeding ponds, ditche etc. or introduction of fish into breeding waters.

1. Loss of grasslands, and grassland groundsquirrel populations.
2. Fragmentation of habitat

Total Respondents **2**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Grassland Habitats in Indiana?

	Yes, these efforts occur	**Not aware of these efforts occuring**	**Response Total**
Statewide year-round monitoring conducted by state agencies	12% (1)	88% (7)	**8**
Statewide once a year monitoring conducted by state agencies	25% (2)	75% (6)	**8**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (8)	**8**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (8)	**8**
Regional or local year-round monitoring conducted by state	12% (1)	88% (7)	**8**

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Regional or local once a year monitoring conducted by state agencies	12% (1)	88% (7)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (8)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	25% (2)	75% (6)	**8**
		Total Respondents	**64**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Grassland Habitats in Indiana?

	Yes, these efforts occur	**Not aware of these efforts occuring**	**Response Total**
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (7)	**7**
		Total Respondents	**56**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Grassland Habitats in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by state agencies	12% (1)	0% (0)	0% (0)	63% (5)	25% (2)	**8**
Statewide once a year monitoring conducted by state agencies	0% (0)	12% (1)	12% (1)	50% (4)	25% (2)	**8**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	12% (1)	50% (4)	38% (3)	**8**

Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	12% (1)	0% (0)	50% (4)	38% (3)	**8**
Regional or local year-round monitoring conducted by state agencies	12% (1)	0% (0)	0% (0)	63% (5)	25% (2)	**8**
Regional or local once a year monitoring conducted by state agencies	0% (0)	0% (0)	12% (1)	50% (4)	38% (3)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	0% (0)	12% (1)	50% (4)	38% (3)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	25% (2)	0% (0)	0% (0)	50% (4)	25% (2)	**8**
				Total Respondents		**64**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Grassland Habitats in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	38% (3)	63% (5)	**8**
Statewide once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	29% (2)	71% (5)	**7**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	38% (3)	63% (5)	**8**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	38% (3)	63% (5)	**8**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	38% (3)	63% (5)	**8**
Regional or local once a year monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	38% (3)	63% (5)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	38% (3)	63% (5)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	29% (2)	71% (5)	**7**
				Total Respondents		**62**

17. Regional or local state agency monitoring for the Wildlife in Grassland Habitats in Indiana.

Statewide within the range of Crawfish frogs: he Indiana Amphibian Monitoring Program (IAMP) part of the North American Amphibian Monitoring Program and Frog Watch are conducted annually during the crawfish frog breeding season. The data can be analyzed regionally

The Indiana Division of Fish and Wildlife and the Divsion of Nature Preserves maintain data on the occurrence location of road-kill, accidently trapped or other verified human encounters with badgers.

Total Respondents **2**

18. Regional or local monitoring by other organizations for the Wildlife in Grassland Habitats in Indiana.

None known

None known

Total Respondents **2**

19. Please list organizations that are monitoring the Wildlife in Grassland Habitats in Indiana.

None known

no monitoring done or needed for some wildlife species.

None known

Total Respondents **3**

20. What are the current monitoring techniques for the Wildlife in Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	80% (4)	0% (0)	0% (0)	20% (1)	**5**
Modeling	0% (0)	0% (0)	60% (3)	0% (0)	20% (1)	20% (1)	**5**
Coverboard routes	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Spot mapping	0% (0)	0% (0)	25% (1)	0% (0)	0% (0)	75% (3)	**4**
Driving a survey route	0% (0)	0% (0)	20% (1)	20% (1)	20% (1)	40% (2)	**5**
Reporting from harvest, depredation, or unintentional take	40% (2)	20% (1)	0% (0)	0% (0)	0% (0)	40% (2)	**5**

(road kill, bycatch)							
Mark and recapture	0% (0)	20% (1)	60% (3)	0% (0)	0% (0)	20% (1)	**5**
Professional survey/census	0% (0)	40% (2)	20% (1)	0% (0)	20% (1)	20% (1)	**5**
Volunteer survey/census	20% (1)	20% (1)	20% (1)	0% (0)	20% (1)	20% (1)	**5**
Trapping (by any technique)	50% (2)	0% (0)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
Representative sites	0% (0)	0% (0)	20% (1)	0% (0)	20% (1)	60% (3)	**5**
Probabilistic sites	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**55**

21. Other monitoring techniques for the Wildlife in Grassland Habitats in Indiana.

1. Sampling for eggs or larva.

Total Respondents **1**

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

More intensive call surveys and larva surveys, especially to determine how far the adults are traveling to deposit their eggs.

If we wanted to survey some wildlife species I would develop a system counting hills.

Continue to monitor road-kills, accidental captures and other verified sightings. Review this data and if warranted (a number of verified sightings near grassland habitat) attempt a telemetry and tracking study.

Total Respondents **3**

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

	Yes, these efforts occur	**No effort that I'm aware of**	**Response Total**
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (8)	**8**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (8)	**8**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (8)	**8**
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	0% (0)	100% (8)	**8**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (8)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (8)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	12% (1)	88% (7)	**8**
		Total Respondents	**64**

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

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	12% (1)	88% (7)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (8)	**8**
	Total Respondents		**64**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Grassland Habitats in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state	12% (1)	0% (0)	12% (1)	63% (4)	25% (2)	**8**

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Statewide once a year inventory and assessment conducted by state agencies	0% (0)	12% (1)	12% (1)	50% (4)	25% (2)	**8**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	12% (1)	50% (4)	33% (3)	**8**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	25% (2)	38% (3)	38% (3)	**8**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	12% (1)	25% (2)	38% (3)	25% (2)	**8**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	12% (1)	50% (4)	38% (3)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	25% (2)	38% (3)	25% (3)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	25% (2)	38% (3)	38% (3)	**8**
				Total Respondents		**64**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Grassland Habitats in Indiana?

	These efforts are very crucial for this HABITAT	**These efforts are somewhat crucial for this HABITAT**	**These efforts are slightly crucial for this HABITAT**	**These efforts are not crucial for this HABITAT**	**Unknown**	**Response Total**
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	12% (1)	38% (3)	50% (4)	**8**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	12% (1)	38% (3)	50% (4)	**8**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	12% (1)	38% (3)	50% (4)	**8**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	12% (1)	0% (0)	25% (2)	25% (2)	38% (3)	**8**

Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	25% (2)	25% (2)	50% (4)	**8**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	12% (1)	38% (3)	50% (4)	**8**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	25% (2)	25% (2)	50% (4)	**8**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	25% (2)	25% (2)	50% (4)	**8**
					Total Respondents	**64**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Grassland Habitats in Indiana.

None:
Crawfish frog habitat is not well understood and is not currently being inventoried to my knowledge. Grasslands may be monitored by not all grasslands are crawfish frog habitat.

none

I believe that Purdue University and the NRCS and perhaps others keep track of grasslands created as part of the Farm Bill Programs. There are also occassional statewide assessments of grassland as part of remote-sensing, GIS based studies such as the GAP Analysis. The Division of Nature Preserves also keeps track of good examples of remnant native grassland. I am not sure any of these agencies collect the grassland habitat data specifically for badgers but other agencies applied the information to badgers.

Total Respondents **3**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Grassland Habitats in Indiana.

None:
Crawfish frog habitat is not well understood and is not currently being inventoried to my knowledge. Grasslands may be monitored by not all grasslands are crawfish frog habitat.

None

None known

Total Respondents **3**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Grassland Habitats in Indiana.

None:
Crawfish frog habitat is not well understood and is not currently being inventoried to my knowledge. Grasslands may be monitored by not all grasslands are crawfish frog habitat.

none

None known

Total Respondents 3

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	29% (2)	29% (2)	0% (0)	0% (0)	43% (3)	**7**
Aerial photography and analysis	0% (0)	29% (2)	14% (1)	0% (0)	0% (0)	57% (4)	**7**
Systematic sampling	0% (0)	0% (0)	29% (2)	0% (0)	0% (0)	71% (5)	**7**
Property tax estimates	0% (0)	0% (0)	14% (1)	0% (0)	0% (0)	86% (6)	**7**
State revenue data	0% (0)	0% (0)	14% (1)	0% (0)	0% (0)	86% (6)	**7**
Regulatory information	0% (0)	0% (0)	14% (1)	0% (0)	0% (0)	86% (6)	**1**
Participation in landuse programs	0% (0)	0% (0)	29% (2)	0% (0)	0% (0)	71% (5)	**7**
Modeling	0% (0)	0% (0)	29% (2)	0% (0)	14% (1)	57% (4)	**7**
Voluntary landowner reporting	0% (0)	0% (0)	14% (1)	0% (0)	0% (0)	86% (6)	**7**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (5)	**5**
					Total Respondents		**68**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Grassland Habitats in Indiana.

None known

none in place, and none needed

Total Respondents 2

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

Crawfish frog habitat may be described by a combination of hydrology, soil type, proximity to breeding waters, and vegetation. These factors should be investigated to develop a model for crawfish frog habitat.

Monitoring of the larger grasslands in Indiana both native and man-made such as the grassland created by stip-minning. Especially monitor the quality and quantity of these areas.

Total Respondents **2**

33. What is the current body of science for the Wildlife in Grassland Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	1	12%
Inadequate	6	75%
Nonexistent	1	12%
Other (please explain below)	0	0%
Total Respondents	8	

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

		Response Total	Response Percent
Title	Amphibians and reptiles of Indiana		
	Mamm. IN	3	100%
	Mammals of the Eastern United States		
Author	Sherman A. Minton, Jr.		
	M & W 1982	3	100%
	J.O. Whitaker, Jr. and W. J. Hamilton, Jr		
Date	2001		
	1998	2	100%
Publisher	Indiana Academy of Sciences		
	Cornell University Press	2	100%
Total Respondents		1	

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

		Response Total	Response Percent
Title		0	0%
Author	www.natureserve.org/explorer www. natureserve.org/explorer	2	100%
Date		0	0%
Publisher		0	0%
	Total Respondents		1

36. What is the current HABITAT body of science for the Wildlife in Grassland Habitats in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		2	33%
Inadequate		3	50%
Nonexistent		1	17%
Other (please explain below)		0	0%
	Total Respondents		6

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

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

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

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

39. What are the research needs for the Wildlife in Grassland Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	12% (1)	38% (3)	12% (1)	38% (3)	0% (0)	8
Distribution and abundance	0% (0)	25% (2)	25% (2)	12% (1)	38% (3)	0% (0)	8
Limiting factors (food, shelter, water, breeding sites)	12% (1)	38% (3)	12% (1)	25% (2)	12% (1)	0% (0)	8
Threats (predators/competition, contamination)	12% (1)	25% (2)	12% (1)	25% (2)	25% (2)	0% (0)	8
Relationship/dependence on specific habitats	12% (1)	25% (2)	25% (2)	25% (2)	12% (1)	0% (0)	8
Population health (genetic and physical)	14% (1)	0% (0)	29% (2)	14% (1)	29% (2)	14% (1)	7
Other (please specify below)	0% (0)	20% (1)	0% (0)	0% (0)	20% (1)	60% (3)	5
Total Respondents							52

40. Other research needs for the Wildlife in Grassland Habitats in Indiana.

Some wildlife species are in great need of study on all aspects of its ecology.

We need more information on the reproduction of some wildlife species in various habitats.

The relationship between badgers and land use and soil type, especially soil types that support borrows both for the badger and its prey.

Total Respondents 3

41. What are the HABITAT research needs for the Wildlife in Grassland Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	25% (2)	38% (3)	12% (1)	25% (2)	0% (0)	**8**
Distribution and abundance (fragmentation)	12% (1)	25% (2)	38% (3)	12% (1)	12% (1)	0% (0)	**8**
Threats (land use change/competition, contamination/global warming)	0% (0)	25% (2)	38% (3)	0% (0)	38% (3)	0% (0)	**8**
Relationship/dependence on specific site conditions	14% (1)	29% (2)	14% (1)	29% (2)	14% (1)	0% (0)	**7**
Growth and development of individual components of the habitat	0% (0)	14% (1)	14% (1)	29% (2)	43% (3)	0% (0)	**7**
Other (please specify below)	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
					Total Respondents		**48**

42. Other HABITAT research needs for the Wildlife in Grassland Habitats in Indiana.

Crawfish frog habitat needs to be adequately described.

Additional information on all phases of the biology of some wildlife species would be helpful. However, some species are in no current danger

The difference between native, warm-season-grass/native forb grasslands; planted, non-native, cool-season grasslands; and CRP grasslands relative to suitability for badgers.

Total Respondents **3**

43. How well do the following conservation efforts address the threats to the Wildlife in Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	63% (5)	12% (1)	12% (1)	12% (1)	**8**
Population management (hunting, trapping)	25% (2)	12% (1)	0% (0)	63% (5)	0% (0)	**8**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	25% (2)	75% (6)	0% (0)	**8**
Reintroduction (restoration)	0% (0)	0% (0)	25% (2)	75% (6)	0% (0)	**8**
Food plots	0% (0)	0% (0)	25% (2)	75% (6)	0% (0)	**8**
Threats reduction	0% (0)	0% (0)	0% (0)	71% (5)	29% (2)	**7**
Native predator control	0% (0)	0% (0)	29% (2)	71% (5)	0% (0)	**7**
Exotic/invasive species control	0% (0)	12% (1)	12% (1)	63% (5)	12% (1)	**8**
Regulation of collecting	0% (0)	43% (3)	29% (2)	14% (1)	14% (1)	**7**

Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (8)	0% (0)	**8**
Translocation to new geographic range	0% (0)	0% (0)	12% (1)	88% (7)	0% (0)	**8**
Protection of migration routes	0% (0)	0% (0)	12% (1)	88% (7)	0% (0)	**8**
Limiting contact with pollutants/contaminants	0% (0)	0% (0)	12% (1)	75% (6)	12% (1)	**8**
Public education to reduce human disturbance	0% (0)	0% (0)	12% (1)	75% (6)	12% (1)	**8**
Culling/selective removal	0% (0)	0% (0)	12% (1)	75% (6)	12% (1)	**8**
Stocking	0% (0)	0% (0)	12% (1)	88% (7)	0% (0)	**8**
Other (please specify below)	0% (0)	0% (0)	17% (1)	67% (4)	17% (1)	**6**
				Total Respondents		**131**

44. Other current conservation practices for the Wildlife in Grassland Habitats in Indiana.

Study burrow making crayfish and their burrows.

Saving grassland (and woodland) will help this animal.

Total Respondents **2**

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

1. Promote non-disturbance in known crawfish frog habitat.
2. Identification of breeding sites and protect the sites from disturbance and the introduction of fish.

Save natural habitats. n

Conservation and restoration of ground squirrel and pocket gopher populations. Limit human access to all parts of large grasslands.

Total Respondents **3**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	38% (3)	12% (1)	25% (2)	25% (2)	**8**
Habitat protection on public lands	12% (1)	63% (5)	12% (1)	0% (0)	12% (1)	**8**
Habitat protection incentives (financial)	0% (0)	25% (2)	25% (2)	0% (0)	50% (4)	**8**
Habitat restoration through regulation	0% (0)	25% (2)	38% (3)	12% (1)	25% (2)	**8**
Habitat restoration on public lands	0% (0)	50% (4)	12% (1)	0% (0)	38% (3)	**8**
Habitat restoration incentives (financial)	0% (0)	33% (2)	17% (1)	17% (1)	33% (2)	**6**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	12% (1)	75% (6)	12% (1)	**8**

Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	25% (2)	63% (5)	12% (1)	**8**
Succession control (fire, mowing)	12% (1)	63% (5)	0% (0)	0% (0)	12% (1)	**7**
Corridor development/protection	0% (0)	38% (3)	12% (1)	38% (3)	12% (1)	**8**
Managing water regimes	0% (0)	0% (0)	43% (3)	43% (3)	14% (1)	**7**
Pollution reduction	0% (0)	0% (0)	14% (1)	43% (3)	43% (3)	**7**
Protection of adjacent buffer zone	0% (0)	43% (3)	14% (1)	14% (1)	29% (2)	**7**
Restrict public access and disturbance	0% (0)	14% (1)	14% (1)	43% (3)	29% (2)	**7**
Land use planning	0% (0)	0% (0)	0% (0)	71% (5)	29% (2)	**7**
Technical assistance	0% (0)	0% (0)	14% (1)	29% (2)	57% (4)	**7**
Cooperative land management agreements (conservation easements)	0% (0)	29% (2)	14% (1)	14% (1)	43% (3)	**7**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	**4**
				Total Respondents		**131**

47. Other current HABITAT conservation practices for the Wildlife in Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

Public ownership (purchase) of know crawfish frog habitat and maintenance of the hydrology of the site and associated breeding waters.

Grassland often have to be maintained by fire. Control-burns are becoming more difficult to conduct due to lack of trained personnel, restricted burn windows, and encroaching development. Grassland management difficulties need to be addressed.

Total Respondents **2**

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

Some wildlife species are very under-studied. Research needs to be conducted and management information developed for public land managers and private land owners (education).

This is a common animal in grassy fields and also in woods. It is doing fine at present, so nothing is needed. Off the subject I wondered why you left off such species as the shrews Sorex hoyi and S. fumeus.

Total Respondents **2**

6. Please rank the following threats to the Wildlife in Early Successional Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
High sensitivity to pollution	0% (0)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Bioaccumulation of contaminants	0% (0)	0% (0)	25% (1)	0% (0)	25% (1)	50% (2)	**4**
Predators (native or domesticated)	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	0% (0)	**4**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	**4**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	**4**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Unregulated collection pressure	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	0% (0)	**4**
					Total Respondents		**43**

7. Please also rank these threats to the Wildlife in Early Successional Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Habitat loss (feeding/foraging areas)	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	0% (0)	**4**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	0% (0)	**4**
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	75% (3)	75% (1)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
					Total Respondents		**39**

8. Other threats to the Wildlife in Early Successional Grassland Habitats in Indiana.

1. Cold wet weather when first litters appear (Late March and early April)

2. Cottontail numbers are proportional to available habitats. To increase or decrease in number, depends on available habitats. Agriculral policy i.e. production without supply side considerations influence the availability of the habitats. Cottontails are a game species and utilized heavily as a recreational resource and is therefore a luxury. The tradeoff concerning the cottontail is that we the American public, want beef,corn and related foodstuffs at a low cost. The cottontail will not prevail here as being necessary under those societal needs!

3. Habitat loss to natural succession is a critical threat to cottontail populations in Indiana.

Total Respondents **3**

9. Please briefly describe the top two threats to the Wildlife in Early Successional Grassland Habitats in Indiana identified above.

1. Invasive/non-native vegetative species such as fescue do not provide cover, nutrition and are thought to be toxic. Habitat loss to uncontrolled vegetative succession is a serious threat.

2. 1)Agricultural policy
2)Domestic predators

3. Habitat loss to agriculture and natural succession

4. Habitat Loss in this relatively specialized habitat is the primary threat to the short-tailed shrew. Early successional grassland habitats provides marginal habitat requirements for this specialized species. The short-tailed shrew is an insectivore/vermivore. Early successional grassland habitat occurs in abandoned land associated with either agricultural, industrial or urban land uses. Only is isolated situations do grasslands develop as a dominate habitat type in Indiana. Most grasslands will eventually be dominated by shrub or tree cover. By definition early successional grassland habitat is a temporary habitat type.

Total Respondents **4**

10. Please rank the following threats to the HABITAT of the Wildlife in Early Successional Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	50% (2)	0% (0)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Invasive/non-native species	25% (1)	25% (1)	0% (0)	0% (0)	25% (1)	25% (1)	**4**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	**4**
Habitat fragmentation	25% (1)	25% (1)	0% (0)	0% (0)	50% (2)	0% (0)	**4**
Successional change	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Habitat degradation	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Stream channelization	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Agricultural/forestry practices	25% (1)	0% (0)	0% (0)	75% (3)	0% (0)	0% (0)	**4**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**64**

11. Other HABITAT threats to the Wildlife in Early Successional Grassland Habitats in Indiana.

No financial incentive to develop/maintain/manage these habitats.

Total Respondents 1

12. Please briefly describe the top two HABITAT threats to the Wildlife in Early Successional Grassland Habitats in Indiana identified above.

1. successional change results in habitat degredation as grasslands are invaded by woody vegetation.

2. 1)Agricultural policy
2)Competing products (food)

3. I believe invasion of early successional grasslands by tall fescue is probably the top threat followed closely by successional change.

Total Respondents 3

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Early Successional Grassland Habitats in Indiana?

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Early Successional Grassland Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (4)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (4)	**4**
		Total Respondents	**31**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

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

Total Respondents 32

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

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

Total Respondents 32

17. Regional or local state agency monitoring for the Wildlife in Early Successional Grassland Habitats in Indiana.

1. In the past,I believe the DFW logged rabbit sightings during quail whistle counts.

2. DNR property harvest data
Annual small game survey of licensed hunters!

Total Respondents 2

18. Regional or local monitoring by other organizations for the Wildlife in Early Successional Grassland Habitats in Indiana.

Not aware of any!

Total Respondents 1

19. Please list organizations that are monitoring the Wildlife in Early Successional Grassland Habitats in Indiana.

1. Not aware of any!

2. The biennial small game harvest survey is the only method currently being used by the division of fish and wildlife to monitor the statewide rabbit population. I am not aware of any other monitoring occuring in the state.

Total Respondents **2**

20. What are the current monitoring techniques for the Wildlife in Early Successional Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Modeling	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Coverboard routes	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Spot mapping	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Driving a survey route	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Mark and recapture	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Professional survey/census	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Volunteer survey/census	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Trapping (by any technique)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Representative sites	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Probabilistic sites	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**17**

21. Other monitoring techniques for the Wildlife in Early Successional Grassland Habitats in Indiana.

Not aware of any!

Total Respondents 1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

1. Trapping and visual surveys.
Trapping is expensive and visual surveys are less expensive nd can be combined with other surveys.
McWheter, Gary Randolph, 1991, Estimating Abudnace of Cottontail Rabbits using live trapping and visual surveys, Master's thesis, University of Tennessee

2. Specifically being done for the cottontail is not warranted. However,an analysis of vegetative structure by specie or species group in early successional habitats and then correllated with selected early successional species would be relevant!

3. I would like to see a rural mail carrier survey initiated that would be useful for monitoring rabbits and several other wildlife species. Another method to monitor rabbit populations would be to include rabbit observations on the division's annual bobwhite whistle counts.

Total Respondents 3

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Early Successional Grassland Habitats in Indiana?

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

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Early Successional Grassland Habitats in Indiana?

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	25% (1)	0% (0)	25% (1)	50% (2)	**4**
Occasional statewide (less than once a year and not regularly scheduled)	25% (1)	0% (0)	0% (0)	25% (1)	50% (2)	**4**

inventory and assessment conducted by state agencies						
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	67% (2)	**3**
				Total Respondents		**27**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

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

conducted by other organizations						
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
					Total Respondents	**32**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Early Successional Grassland Habitats in Indiana.

DNR property evaluations, but I know of nothing organized!

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Early Successional Grassland Habitats in Indiana.

There are Farm Bill/CRP type inventories but none done specifically for the Cottontail!

Total Respondents **1**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Early Successional Grassland Habitats in Indiana.

1. None specifically for the Cottontail!

2. I am not aware of any scheduled monitoring of early successional habitat in Indiana. I would suspect that one of the universities has remotely sensed data but their objective probably isn't specifically to monitor early successional habitat.

Total Respondents **2**

30. What are the current monitoring techniques for the Wildlife in Early Successional Grassland Habitats in Indiana?

If a technique is not applicable to the Wildlife in Early Successional Grassland Habitats, do not select a response in that row.

	Frequently used	**Occasionally used**	**Not used but possible with existing technology and data**	**Not used and not possible with existing technology and data**	**Not economically feasible**	**Unknown**	**Response Total**
GIS mapping	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Aerial photography and analysis	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Systematic sampling	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**

State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	**3**
Participation in landuse programs	0% (0)	0% (0)	50% (2)	0% (0)	25% (1)	25% (1)	**4**
Modeling	0% (0)	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	**4**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**30**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Early Successional Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

1. Cottontails are a mid to late early successional habitat resident. We do not know the amount of structure required to maintain optimum populations. We don't know what an optimum population is! We do know that it cycles but we don't know why! That isn't a good answer, I don't know a good answer for that!

2. The best habitat inventory technique would be creating a GIS with Landsat data from different time periods.

Total Respondents **2**

33. What is the current body of science for the Wildlife in Early Successional Grassland Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**2**	**50%**
Inadequate	**2**	**50%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
Total Respondents		**4**

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

Title = Population Ecology and Harvest of the Cottontail Rabbit
Author = Heraold A.Demaree, Jr
Date = 1978
Publisher = Indiana DFW

Title = Population ecology and harvest of the cottontail rabbit on the Pigeon River fish and wildlife area, 1962-1970
Author = Harold Demaree Jr.
Date = 1978
Publisher = Indiana Division of Fish and Wildlife

Title = A 14-year study of BLARINA BREVICAUDA in east-central Illinois.
Author = Getz, L. L.
Date = 1989
Publisher = J. Mammalogy 70:58-66.

Response Total **Response Percent**

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

Title = Blarina bravicauda
Author = George,S. B., J. R. Choate, and H. H. Genoways
Date = 1986
Publisher = Mammalian Species 261:1-9

Response Total **Response Percent**

36. What is the current HABITAT body of science for the Wildlife in Early Successional Grassland Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	2	50%
Inadequate	2	50%
Nonexistent	0	0%
Other (please explain below)	0	0%
Total Respondents		4

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

Title = A4-year study study of BLARINA BREVICAUDA un east-central Illinois
Author = Getz, L. L.
Date = 1989
Publisher = J. Mammalogy 70:58-66.

Response Total **Response Percent**

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

		Response Total	Response Percent
Title	I can't	**1**	**100%**
Author		**0**	**0%**
Date		**0**	**0%**
Publisher		**0**	**0%**
	Total Respondents		**1**

39. What are the research needs for the Wildlife in Early Successional Grassland Habitats in Indiana?

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

40. Other research needs for the Wildlife in Early Successional Grassland Habitats in Indiana.

Determine what affect feral cats have on a local cottontail population!

Total Respondents **1**

41. What are the HABITAT research needs for the Wildlife in Early Successional Grassland Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	**4**
Distribution and abundance (fragmentation)	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Threats (land use							

change/competition, contamination/global warming)							
Relationship/dependence on specific site conditions	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Growth and development of individual components of the habitat	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**19**

42. Other HABITAT research needs for the Wildlife in Early Successional Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

43. How well do the following conservation efforts address the threats to the Wildlife in Early Successional Grassland Habitats in Indiana?

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

Total Respondents 64

44. Other current conservation practices for the Wildlife in Early Successional Grassland Habitats in Indiana.

1. vegetative succession control

2. Provide additional habitats through programs, agricultural and other. Rabbits are a by product of an economy. The more human needs placed on the landscape the less amount of by products will be produced. As I mentioned above: If we select for beef and corn there will be less rabbits. By selecting for you simultaneously select against something else. Maybe we need to find out how many steaks we need will determine how many rabbits we have!

Total Respondents 2

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

1. Promote early succession associated with structure similar to L. japonica.

2. The best strategy would be to protect as much early successional habitat as possible but that habitat must be manipulated periodically to set back natural succession.

3. Manage lands for early successional grassland habitat - would require land use change every 3 to 5 years.

Total Respondents 3

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Early Successional Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	4
Habitat protection on public lands	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	4
Habitat protection incentives (financial)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	4
Habitat restoration through regulation	0% (0)	25% (1)	0% (0)	75% (3)	0% (0)	4
Habitat restoration on public lands	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	4
Habitat restoration incentives (financial)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	4
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	50% (2)	0% (0)	50% (2)	0% (0)	4
Selective use of functionally equivalent exotic species in place of extirpated natives	25% (1)	0% (0)	25% (1)	50% (2)	0% (0)	4
Succession control (fire, mowing)	75% (3)	25% (1)	0% (0)	0% (0)	0% (0)	4
Corridor development/protection	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	4
Managing water regimes	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	4
Pollution reduction	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	4
Protection of adjacent buffer zone	0% (0)	0% (0)	0% (0)	75% (3)	25% (1)	4

Restrict public access and disturbance	0% (0)	50% (2)	0% (0)	50% (2)	0% (0)	**4**
Land use planning	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Technical assistance	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Cooperative land management agreements (conservation easements)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**68**

47. Other current HABITAT conservation practices for the Wildlife in Early Successional Grassland Habitats in Indiana.

Strip spraying/interseeding

Total Respondents **1**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Early Successional Grassland Habitats in Indiana?

1. Prescribed burning, becuase it is useful in controlling vegetative succession. Uncontrolled vegetative succession eventually excludes rabbits and makes future management difficult due to concerns for the Indiana Bat.
Stribling, H.L. and Speake, D. W. 1991. Responses of Bobwhie WQuail and EAstern Cottontail Rabbit Populations to Prescribed Burning, Cover Enhancement and Food Plots. Alabama Game & Fish Divison/Auburn University

2. Maintenance of early sucessional components!

3. Successional control is the best method to maintail useable rabbit habitat.

4. Early successional grassland habitat maintenance would require "restart succession is areas. Disturbance of a magnitude to create bare ground, such as a complete burn, plowing, etc. would be required to accomplish this goal.

Total Respondents **4**

49. Do you have any additional comments or information on the Wildlife in Early Successional Grassland Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

No!

Total Respondents **1**

6. Please rank the following threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	100% (3)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Habitat loss (feeding/foraging areas)	67% (2)	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Small native range (high endemism)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Large home range requirements	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Viable reproductive population size or availability	0% (0)	33% (1)	0% (0)	33% (1)	0% (0)	33% (1)	**3**
Specialized reproductive behavior or low reproductive rates	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	0% (0)	**3**
Degradation of movement/migration routes	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	**3**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	33% (1)	**3**
Unknown	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**31**

8. Other threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

The impacts of herbicides and pesticides drifting over from nearby agricultural lands in unknown.

Mowing in June, July and August.

Total Respondents **2**

9. Please briefly describe the top two threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana identified above.

1. The primary threat is the loss of these farm programs. An additional threat would be the loss or shortening of the primary nesting season dates established by the USDA. Mowing or haying during the quail nesting season would be allowed on enrolled acreage if these dates were eliminated or shortened.

2. Loss of Quality nesting and brood habitat. Habitat fragmentation.

Lack of large areas in native grass and mowing during the breeding season.

Total Respondents **3**

10. Please rank the following threats to the HABITAT of the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	**3**
Counterproductive financial incentives or regulations	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	0% (0)	**3**
Invasive/non-native species	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	0% (0)	**3**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Habitat fragmentation	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Successional change	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	**3**
Habitat degradation	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**3**
Climate change	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**

Stream channelization	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Agricultural/forestry practices	67% (2)	0% (0)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Residual contamination (persistent toxins)	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Mining/acidification	0% (0)	0% (0)	33% (1)	33% (1)	33% (1)	0% (0)	**3**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	100% (3)	0% (0)	**3**
Unknown	0% (0)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Other (please specify below)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**52**

11. Other HABITAT threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

If the farm bill programs (e.g. CRP) were to be eliminated the negative effects on Indiana's northern bobwhite population would be substantial.

Total Respondents **1**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana identified above.

1. Succession of the grassland habitat is a major threat if mid-contract activies are not performed. Another threat is mowing or haying during the primary nesting season. These activities are not currently allowed until after July 15 but mowing during late July and early August still destroys some nests and young.

2. Habitat Fragmentation & Urban sprawl. Clean Farming.

Loss of large areas of warm season grasses and early mowing/haying.

Total Respondents **3**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (3)	**3**
Statewide once a year monitoring conducted by state agencies	100% (3)	0% (0)	**3**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	67% (2)	33% (1)	**3**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Regional or local year-round monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Regional or local once a year monitoring conducted by state agencies	67% (2)	33% (1)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	33% (1)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (2)	**2**
		Total Respondents	**23**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

Total Respondents	**24**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

17. Regional or local state agency monitoring for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

1. The Indiana Division of Fish and Wildlife conducts a biennial mailing survey to small game hunters to estimate harvest. Additionally, the division conducts and annual spring whistle counts to provide an index to the spring breeding population. However, neither of these methods focus directly on farm bill habitats.

2. Interlake Property, Division of Outdoor Recreation ownership.

Surveys on state properties, and thru efforts such as the Breeding Bird Atlas projects

Total Respondents **3**

18. Regional or local monitoring by other organizations for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

The breeding bird survey is conducted by the National Audubon Society and observers counts the number of bobwhites

seen along with other bird species. Again this survey is not directly focues on farm bill habitats.

BBS routes and work done on Strip mine lands in SW IN, and Big Oaks NWR

Total Respondents 2

19. Please list organizations that are monitoring the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

I am only aware of the breeding bird survey conducted by the National Audubon Society.

INDNR, USFWS, TNC, USFS, Indiana State University

Total Respondents 2

20. What are the current monitoring techniques for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

Other (please specify below)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
						Total Respondents	**35**

21. Other monitoring techniques for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

I'm not aware of any bobwhite monitoring that focuses directly on populations in farm bill habitats.

Nest monitoring

Total Respondents **2**

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

To monitor bobwhite populations specificially in farm bill habitats I would suggest selecting a random sample of contracts and conducting flushing transects. Another intensive method would be to have hunters complete "report cards" when hunting on farm bill acreage. A less intensive method would be to request that landowners conduct whistle counts on their enrolled lands each spring.

Fall Covey counts.

Professional and Volunteer survey and census

Total Respondents **3**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

regularly scheduled) inventory and assessment conducted by state agencies	
Total Respondents	**24**

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

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	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	**2**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
				Total Respondents		**23**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

1. I'm not aware of any regularly scheduled assessment of farm bill lands for northern bobwhites.

2. Interlake Property

Habitats on State areas are occasionally surveyed for quality and quantity.

Total Respondents **3**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

1. The Farm Service Agency keeps track of the location and acreage associated with each contract.

2. Unknown

3. USFWS, USFWS, TNC, Indiana State University have surveyed quality and quantity of habitats for HESP's.

Total Respondents **3**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

1. The Indiana Division of Fish and Wildlife will be initiated some type of bobwhite monitoring program to determine the success of the newest continuous CRP practice (CP33). The Farm Service Agency monitors acreage and location of tracts enrolled in each USDA program. The Natural Resource Conservation Service provides technical support or administers most farm programs and I believe they conduct regular inspections.

2. Unknown

3. INDNR, USDA, USFS, TNC, Indiana State University

Total Respondents **3**

30. What are the current monitoring techniques for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

If a technique is not applicable to the Wildlife in Farm Bill Program Grassland Habitats do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	33% (1)	0% (0)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Aerial photography and analysis	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Systematic sampling	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Property tax estimates	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
State revenue data	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Regulatory information	0% (0)	0% (0)	0% (0)	33% (1)	0% (0)	67% (2)	**3**
Participation in landuse programs	33% (1)	0% (0)	0% (0)	0% (0)	0% (0)	67% (2)	**3**
Modeling	0% (0)	67% (2)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Voluntary landowner reporting	0% (0)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**27**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

I recently correlated the number of acres enrolled in USDA programs with our annual bobwhite whistle indices on a statewide scale. I am planning on modeling regional bobwhite indices and USDA idled acreage.

Total Respondents **1**

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

1. Flush counts or more intensive whistle counts on farm program lands would be a useful method of evaluating their quality when compared to the same indices on non-farmbill lands.

2. Grassland maping by major plant species type.

3. GIS mapping and participation in landuse programs (CRP)

Total Respondents **3**

33. What is the current body of science for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

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

		Response Total	Response Percent
Title	HESPS in mine land MS Thesis	1	0%
Author	Travis Devault	1	0%
Date	2000	1	0%
Publisher	Indiana State Univ	1	0%
	Total Respondents	1	
	(skipped this question)	2	

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

		Response Total	Response Percent
Title	Forest and Grassland Bird Productivity	1	0%
Author	Robb et. al.	1	0%
Date	1998	1	0%
Publisher	USFWS internal report	1	0%

Total Respondents	**1**

36. What is the current HABITAT body of science for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

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

		Response Total	Response Percent
Title	Vegetation management practices on conservation reserve program fields to improve northern bobwhite habitat quality	**1**	**100%**
	Strip mine grassland birds		
Author	Greenfield, K. C.; W. B. Burger Jr.; M. J. Chamberlain, E. W. Kurzejeski	**1**	**100%**
	Travis Devault		
Date	2002	**1**	**100%**
	2000		
Publisher	Wildlife Society Bulletin	**1**	**100%**
	Indiana State Univ.		
Total Respondents			**1**

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

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

Publisher	0	0%
Total Respondents		0

39. What are the research needs for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

40. Other research needs for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

1. I would like to see some research to determine the extent to which mowing and haying negatively impact production following the end of the primary nesting season (as defined by the USDA). Following July 15 in Indiana landowners can mow or hay there enrolled lands. I believe a substantial proportion of bobwhites are still nesting at that time.

2. How to reduce clean farming and increasing field size.

Total Respondents	2

41. What are the HABITAT research needs for the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

individual components of the habitat							
Other (please specify below)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**17**

42. Other HABITAT research needs for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

1. Seeding mixtures and mid-contract management activities currently utilized on farm bill lands need to be evaluated to determine their value to bobwhite nesting and brood rearing.

2. How to create and maintain quality grassland habitat on a permanant basis.

Total Respondents **2**

43. How well do the following conservation efforts address the threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

	Very well	**Somewhat**	**Not at all**	**Not used**	**Unknown**	**Response Total**
Habitat protection (use below for details)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Population management (hunting, trapping)	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Reintroduction (restoration)	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Food plots	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Threats reduction	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Native predator control	0% (0)	33% (1)	0% (0)	67% (2)	0% (0)	**3**
Exotic/invasive species control	33% (1)	33% (1)	33% (1)	0% (0)	0% (0)	**3**
Regulation of collecting	0% (0)	0% (0)	67% (2)	0% (0)	33% (1)	**3**
Disease/parasite management	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Translocation to new geographic range	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Protection of migration routes	33% (1)	0% (0)	33% (1)	33% (1)	0% (0)	**3**
Limiting contact with pollutants/contaminants	0% (0)	33% (1)	33% (1)	0% (0)	33% (1)	**3**
Public education to reduce human disturbance	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
Culling/selective removal	0% (0)	0% (0)	33% (1)	67% (2)	0% (0)	**3**
Stocking	0% (0)	0% (0)	67% (2)	33% (1)	0% (0)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**48**

44. Other current conservation practices for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 2

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

1. I would require mid-contract management (e.g. disking or burning) between 3-5 years after establishement on all farm bill acreage planted to grasses.

2. Permanant protection of grassland habitat.

3. Protection of habitat and restoration of habitat

Total Respondents **3**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

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

Cooperative land management agreements (conservation easements)	67% (2)	33% (1)	0% (0)	0% (0)	0% (0)	**3**
Other (please specify below)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents	**52**

47. Other current HABITAT conservation practices for the Wildlife in Farm Bill Program Grassland Habitats in Indiana.

preventing the early mowing/haying of CRP land or other habitat

Total Respondents **1**

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Farm Bill Program Grassland Habitats in Indiana?

Making mid-contract management mandatory on enrolled acreage.

Protection/restoration of habitat and preventing early mowing/haying

Total Respondents **2**

(skipped this question) 1

49. Do you have any additional comments or information on the Wildlife in Farm Bill Program Grassland Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

1. A substantial proportion of Indiana's non-farm program early successional habitat has been lost over the last 30 years and the farm bill grasslands now constitute a substantial proportion of the bobwhites habitat in the state.

2. I think we know what needs to be completed but the question is how to get the Private landownership to practice what is needed on a large scale.

3. CRP has been beneficial for HESP's in Indiana. We need to continue to encourage incentives to private landowners to keep land in grassland habitat that is beneficial to HESP's.

Total Respondents **3**

Appendix E-52: Fescue

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

6. Please rank the following threats to the Wildlife in Hayland Grassland Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Hayland Grassland Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Habitat loss (feeding/foraging areas)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Small native range (high endemism)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Large home range requirements	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Viable reproductive population size or availability	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	**2**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Degradation of movement/migration routes	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**18**

8. Other threats to the Wildlife in Hayland Grassland Habitats in Indiana.

1. Early harvesting of hay crops.

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

9. Please briefly describe the top two threats to the Wildlife in Hayland Grassland Habitats in Indiana identified above.

1. Habitat loss and fragmentation create small, isolated patches where nest predation and brood parasitism tend to increase.
The timing and frequency of haying, as well as the cover type (alfalfa) can negatively affect nest success and limit productivity.

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

10. Please rank the following threats to the HABITAT of the Wildlife in Hayland Grassland Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Counterproductive financial incentives or regulations	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Invasive/non-native species	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Habitat fragmentation	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Successional change	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	**2**
Diseases (of plants that create habitat)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Habitat degradation	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Climate change	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**

Stream channelization	0% (0)	0% (0)	0% (0)	50% (1)	50% (1)	0% (0)	**2**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	0% (0)	**2**
Agricultural/forestry practices	0% (0)	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Residual contamination (persistent toxins)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Point source pollution (continuing)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	0% (0)	**2**
Mining/acidification	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Unknown	0% (0)	0% (0)	50% (1)	0% (0)	50% (1)	0% (0)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**33**

11. Other HABITAT threats to the Wildlife in Hayland Grassland Habitats in Indiana.

No responses were entered for this question.

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

12. Please briefly describe the top two HABITAT threats to the Wildlife in Hayland Grassland Habitats in Indiana identified above.

1. Conversion of hayfields to row-crop or urban cover types
Frequent haying, mowing, or over-grazing (though some disturbance is necessary every 1-5 years to maintain the proper vegetation structure).

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

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Hayland Grassland Habitats in Indiana?

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

agencies			
Regional or local year-round monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Regional or local once a year monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	50% (1)	50% (1)	**2**
		Total Respondents	**16**

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Hayland Grassland Habitats in Indiana?

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Regional or local year-round monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Regional or local once a year monitoring conducted by other organizations	100% (2)	0% (0)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	50% (1)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	100% (2)	0% (0)	**2**
		Total Respondents	**16**

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**

Statewide once a year monitoring conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Regional or local year-round monitoring conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Regional or local once a year monitoring conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
				Total Respondents		**16**

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

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

Total Respondents	**15**

17. Regional or local state agency monitoring for the Wildlife in Hayland Grassland Habitats in Indiana.

1. IDNR's Nongame and Endangered Wildlife Program

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

18. Regional or local monitoring by other organizations for the Wildlife in Hayland Grassland Habitats in Indiana.

1. Breeding Bird Survey routes are scattered throughout the state depending on volunteer participation.
Local intensive surveys, nest monitoring, or mark-recapture studies.

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

19. Please list organizations that are monitoring the Wildlife in Hayland Grassland Habitats in Indiana.

1. Indiana Academy of Science, Indiana Audubon Society, an local chapters of NAS worked with IDNR to complete Breeding Bird Atlas (1985-1990)
USGS Bird Banding Lab coordinates BBS
Universities such as Purdue complete local-level research projects

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

20. What are the current monitoring techniques for the Wildlife in Hayland Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Spot mapping	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**

Driving a survey route	100% (2)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**2**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Mark and recapture	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Professional survey/census	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Volunteer survey/census	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Trapping (by any technique)	0% (0)	50% (1)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
Representative sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**15**

21. Other monitoring techniques for the Wildlife in Hayland Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 3

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

1. point counts during breeding season
2. Establish more Breeding Bird Survey routes http://www.pwrc.usgs.gov/bbs/
   Conduct point counts on private lands. If possible estimate nest success too.

Total Respondents **2**

(skipped this question) 1

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

	Yes, these efforts occur	**No effort that I'm aware of**	**Response Total**

Statewide annual inventory and assessment conducted by state agencies	50% (1)	50% (1)	**2**
Statewide once a year inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	50% (1)	50% (1)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	50% (1)	50% (1)	**2**
Regional or local year-round inventory and assessment conducted by state agencies	50% (1)	50% (1)	**2**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	0% (0)	100% (2)	**2**
		Total Respondents	**16**

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

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

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total

Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**7**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Hayland Grassland Habitats in Indiana.

1. Annual and 5-year-census, county-level reports of acreage planted to various hay cover types and acreage harvested.

Total Respondents **1**

(skipped this question) 2

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Hayland Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 3

29. Please list organizations that are monitoring this HABITAT for the in Indiana.

1. USDA National Agricultural Statistics Service for Indiana http://www.nass.usda.gov/in/

Total Respondents **1**

(skipped this question) 2

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Hayland Grassland Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Systematic sampling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Participation in landuse programs	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**9**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Hayland Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 3

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

1. Survey of hay harvest dates and frequencies each year

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

33. What is the current body of science for the Wildlife in Hayland Grassland Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	**0**	**0%**
Adequate	**0**	**0%**
Inadequate	**1**	**100%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
Total Respondents		**1**
(skipped this question)		2

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

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

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

Title = Effects of management practices on grassland birds: Bobolink
Author = Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman and B.R. Euliss
Date = 2001
Publisher = Northern Prairie Wildlife Research Center

	Response Total	Response Percent
(skipped this question)		2

36. What is the current HABITAT body of science for the Wildlife in Hayland Grassland Habitats in Indiana?

	Response Total	Response Percent

Complete, up to date and extensive	**0**	**0%**
Adequate	**0**	**0%**
Inadequate	**1**	**100%**
Nonexistent	**0**	**0%**
Other (please explain below)	**0**	**0%**
	Total Respondents	**1**
	(skipped this question)	2

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

	Response Total	Response Percent
Title	**0**	**0%**
Author	**0**	**0%**
Date	**0**	**0%**
Publisher	**0**	**0%**
	Total Respondents	**0**
	(skipped this question)	3

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

	Response Total	Response Percent
Title	**0**	**0%**
Author	**0**	**0%**
Date	**0**	**0%**
Publisher	**0**	**0%**
	Total Respondents	**0**
	(skipped this question)	3

39. What are the research needs for the Wildlife in Hayland Grassland Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Distribution and abundance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Limiting factors (food, shelter, water, breeding sites)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Threats (predators/competition, contamination)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Relationship/dependence on specific habitats	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Population health (genetic and physical)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**7**

40. Other research needs for the in Indiana.

View responses to this question view

Total Respondents **1**

(skipped this question) 2

41. What are the HABITAT research needs for the Wildlife in Hayland Grassland Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Hayland Grassland Habitats in Indiana.

1. Timing and frequency of haying and other agricultural disturbances

Total Respondents **1**

(skipped this question) 2

43. How well do the following conservation efforts address the threats to the Wildlife in Hayland Grassland Habitats in Indiana?

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

44. Other current conservation practices for the Wildlife in Hayland Grassland Habitats in Indiana.

1. Restoration of native grasslands, and increased enrollment in Conservation Reserve Program provide refuges from agricultural disturbances (provided the proper vegetation structure is maintained).

Total Respondents **1**

(skipped this question) 2

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

1. Time and haying and grazing around the breeding cycle - before May or after June.

Total Respondents **1**

(skipped this question) 2

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Hayland Grassland Habitats in Indiana?

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

47. Other current HABITAT conservation practices for the Wildlife in Hayland Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 3

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Hayland Grassland Habitats in Indiana?

1. Provide incentives to prevent landowners from haying or grazing during the breeding season.
Educate landowners about the importance of their land to the persistence of some wildlife species.

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

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

1. Bobolinks may disperse from breeding sites in response to nest failure. Two spatially separated populations may be demographically linked by dispersal, so what happens on one field may affect birds on another field. Although the dispersal ability of the species has not been well-quantified, its at least on the scale of a county, if not multiple counties. Management and conservation should occur at these larger spatial scales. Managing a network of different grassland types using different disturbance regimes so that some populations nest successfully every year could provide a balance between agricultural production and Bobolink production.

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

Appendix E-54: Pasture

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

6. Please rank the following threats to the Wildlife in Prairie Grassland Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Prairie Grassland Habitats in Indiana.

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

8. Other threats to the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

9. Please briefly describe the top two threats to the Wildlife in Prairie Grassland Habitats in Indiana identified above.

1. Availability of habitat.
Mowing grasslands.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Prairie Grassland Habitats in Indiana.

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

11. Other HABITAT threats to the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

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

12. Please briefly describe the top two HABITAT threats to the Wildlife in Prairie Grassland Habitats in Indiana identified above.

1.	Mowing during breeding season. Conversion of grasslands to row-crops or housing developments.	
	Total Respondents	**1**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Prairie Grassland Habitats in Indiana?

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Prairie Grassland Habitats in Indiana?

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

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

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

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Statewide once a year monitoring conducted by other organizations	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

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

17. Regional or local state agency monitoring for the Wildlife in Prairie Grassland Habitats in Indiana.

1. none

Total Respondents **1**

18. Regional or local monitoring by other organizations for the Wildlife in Prairie Grassland Habitats in Indiana.

1. statewide Breeding Bird Survey, May Day Bird Counts, Summer Bird Counts

Total Respondents **1**

19. Please list organizations that are monitoring the Wildlife in Prairie Grassland Habitats in Indiana.

1. USGS, birding organizations

Total Respondents **1**

20. What are the current monitoring techniques for the Wildlife in Prairie Grassland Habitats in Indiana?

	Frequently used	**Occasionally used**	**Not used but possible with existing technology and data**	**Not used and not possible with existing technology and data**	**Not economically feasible**	**Unknown**	**Response Total**

Radio telemetry and tracking	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Spot mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Driving a survey route	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Mark and recapture	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Professional survey/census	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Volunteer survey/census	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Trapping (by any technique)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Representative sites	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Probabilistic sites	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**10**

21. Other monitoring techniques for the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

1. Roadside surveys; spot-mapping on smaller areas

Total Respondents **1**

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

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

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

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

Total Respondents	**8**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Prairie Grassland Habitats 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	These efforts are not crucial for this HABITAT	Unknown	Response Total

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Prairie Grassland Habitats in Indiana.

1. none

Total Respondents **1**

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Prairie Grassland Habitats in Indiana.

1. statewide aerial imagery of habitats, land uses

Total Respondents **1**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Prairie Grassland Habitats in Indiana.

1. USDA?

Total Respondents **1**

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Prairie Grassland Habitats do not select a response in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Aerial photography and analysis	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Systematic sampling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Participation in landuse programs	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**9**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

1. Aerial imagery couple with modeling.

Total Respondents **1**

33. What is the current body of science for the Wildlife in Prairie Grassland Habitats in Indiana?

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

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

Title = Atlas of Breeding Birds of Indiana
Author = Castrale, JS, E Hopkins, C Keller
Date = 1988
Publisher = IDNR

Response Total	Response Percent

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

Title = BNA Account – Savannah
Author = Wheelwright and Rising
Date = 1993
Publisher = American Ornithologists' Union

Response Total	Response Percent

36. What is the current HABITAT body of science for the Wildlife in Prairie Grassland Habitats in Indiana?

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

Total Respondents	**1**

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

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

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

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

39. What are the research needs for the Wildlife in Prairie Grassland Habitats in Indiana?

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

Total Respondents	**6**

40. Other research needs for the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

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

41. What are the HABITAT research needs for the Wildlife in Prairie Grassland Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

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

43. How well do the following conservation efforts address the threats to the Wildlife in Prairie Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**

Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Food plots	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Threats reduction	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Native predator control	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Exotic/invasive species control	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Regulation of collecting	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of migration routes	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Limiting contact with pollutants/contaminants	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Public education to reduce human disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Stocking	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**16**

44. Other current conservation practices for the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

1. Conservation and active management of grassland habitats.

Total Respondents **1**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Prairie Grassland Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat protection on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat protection incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**

Habitat restoration through regulation	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration on public lands	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat restoration incentives (financial)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Succession control (fire, mowing)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Corridor development/protection	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Managing water regimes	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Pollution reduction	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Protection of adjacent buffer zone	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Restrict public access and disturbance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Land use planning	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Technical assistance	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Cooperative land management agreements (conservation easements)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**17**

47. Other current HABITAT conservation practices for the Wildlife in Prairie Grassland Habitats in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Prairie Grassland Habitats in Indiana?

1. Incentives for conserving and managing grasslands.

Total Respondents **1**

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

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

Appendix E-56: Reclaimed Minelands

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

6. Please rank the following threats to the Wildlife in Savanna Grassland Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Savanna Grassland Habitats in Indiana.

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

8. Other threats to the Wildlife in Savanna Grassland Habitats in Indiana.

1. Fire suppression

2. Fire suppression is a major threat to many, many wildlife species in the state. Savanna habitats are seriously degraded because fire suppression has allowed shade tolerant species to dominate the understory, changing the open savanna structure into a dense forest with an impenetrable understory. Fire keeps the structure open and results in a varied mosaic of habitats, including fire killed trees which provide both food and shelter.

Total Respondents **2**

9. Please briefly describe the top two threats to the Wildlife in Savanna Grassland Habitats in Indiana identified above.

1. This species is more of an obligate to open areas with scattered dead trees than most Indiana species. Outright loss of this habitat configuration is probably the leading threat to the Red-headed Woodpecker. West Nile Virus is probably currently the second greatest threat.

2. Fire suppression. See above.

Total Respondents	**2**

10. Please rank the following threats to the HABITAT of the Wildlife in Savanna Grassland Habitats in Indiana.

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

11. Other HABITAT threats to the Wildlife in Savanna Grassland Habitats in Indiana.

1. Loss of disturbance regimes that maintained the open structure of savannas (and swamp-forests) where the Red-headed Woodoecker resides.

2. Fire suppression is the major threat. Lack of fire also results in an increase of shade-tolerant invasive species like garlic mustard and Asian bush honeysuckle, further degrading the savanna habitat.

Total Respondents	**2**

12. Please briefly describe the top two HABITAT threats to the Wildlife in Savanna Grassland Habitats in Indiana identified above.

1. Conversion of savanna to agricultural and development uses.
Loss of open structure in existing savannas due to loss of disturbances such as fire.

2. Fire suppression is resulting in successional change to more shade-tolerant forests. Forestry practices are not emphasizing the need for fire in savanna areas enough.

Total Respondents **2**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Savanna Grassland Habitats in Indiana?

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Savanna Grassland Habitats in Indiana?

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

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

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

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**

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

17. Regional or local state agency monitoring for the Wildlife in Savanna Grassland Habitats in Indiana.

I am not aware of any concerted monitoring for the Red-headed Woodpecker by state agencies.

Total Respondents **1**

(skipped this question) 1

18. Regional or local monitoring by other organizations for the Wildlife in Savanna Grassland Habitats in Indiana.

The national Breeding Bird Survey includes routes in Indiana that incoporate sites occupied by the Red-headed Woodpecker. This annual survey will therefore potentially count Red-headed Woodpeckers at a few sites yearly.

Total Respondents **1**

(skipped this question) 1

19. Please list organizations that are monitoring the Wildlife in Savanna Grassland Habitats in Indiana.

The U.S. Geological Survey in Porter, Indiana has conducted studies of oak savanna birds, including the Red-headed Woodpecker.

Total Respondents **1**

(skipped this question) 1

20. What are the current monitoring techniques for the Wildlife in Savanna Grassland Habitats in Indiana?

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

21. Other monitoring techniques for the Wildlife in Savanna Grassland Habitats in Indiana.

Distance sampling

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

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

Point counts in potential habitats using distance sampling. This technique is relatively simple to implement and provides density information rather than an index. Observers count birds from points randomly located in the studied habitat and measure or estimate distance to observed birds. Calculation of density from the data, however, does require some technical expertise.

Buckland, S. T., D. R. Anderson, et al. (2001). Introduction to distance sampling. Oxford, UK, Oxford University Press.

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

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

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

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

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**

Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (2)	**2**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	50% (1)	50% (1)	**2**
		Total Respondents	**2**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

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

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	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
				Total Respondents		**2**

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

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

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Savanna Grassland Habitats in Indiana.

Indiana DNR/DNP has inventoried habitats across the state over the past three decades. Savannas mainly occur in the northern third of the state.

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

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Savanna Grassland Habitats in Indiana.

In the northern third of the state.

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

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Savanna Grassland Habitats in Indiana.

Indiana DNR/DNP, The Nature Conservancy, Chicago Wilderness, U.S. Geological Survey, National Park Service, U.S. Fish and Wildlife Service.

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

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Savanna Grassland Habitats in Indiana.

If a technique is not applicable to the Wildlife in Savanna Grassland Habitats, do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Aerial photography and analysis	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Systematic sampling	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**

Regulatory information	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Participation in landuse programs	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Modeling	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
					Total Respondents		**2**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Savanna Grassland Habitats in Indiana.

View responses to this question view

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

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

View responses to this question view

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

33. What is the current body of science for the Wildlife in Savanna Grassland Habitats in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		**0**	**0%**
Adequate		**1**	**50%**
Inadequate		**0**	**0%**
Nonexistent		**0**	**0%**
Other (please explain below)	We know quite a bit about habitat use patterns of the Red-headed Woodpecker but much less about the effects of landscape fragmentation.	**1**	**50%**
	Total Respondents		**2**

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

Title = Red-headed Woodpecker (Melanerpes erythrocephalus). In The Birds of North America, No. 518
Author = Smith, K. G., J. H. Withgott, and P. G. Rodewald.
Date = 2000
Publisher = The Birds of North America, Inc., Philadelphia, PA.

Response Total **Response Percent**

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

Title = 1998. Atlas of Breeding Birds of Indiana Atlas of Breeding Birds of Indiana
Author = Castrale, John S., Edward M. Hopkins, and Charles E. Keller.
Date = 1998
Publisher = Indiana Department of Natural Resources

Response Total **Response Percent**

36. What is the current HABITAT body of science for the Wildlife in Savanna Grassland Habitats in Indiana?

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

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

Title = Surviving where ecosystems meet: ecotonal animal communities of midwestern oak savannas and woodlands
Author = Temple, Stanley A.
Date = 1998
Publisher = Transactions of the Wisconsin Academy of Sciences, Arts and Letters 86:206-222

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

Title = Savannas, barrens, and rock outcrop plant communities of North America
Author = Anderson, Roger C., Fralish, James S. , and Baskin, Jerry M.
Date = 1999
Publisher = Cambridge University Press

39. What are the research needs for the Wildlife in Savanna Grassland Habitats in Indiana?

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

40. Other research needs for the Wildlife in Savanna Grassland Habitats in Indiana.

Detailed demographic data need to be gathered and the effects of habitat structure and fragmentation on those demographic parameters understood.

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

41. What are the HABITAT research needs for the Wildlife in Savanna Grassland Habitats in Indiana?

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

42. Other HABITAT research needs for the Wildlife in Savanna Grassland Habitats in Indiana.

Relationship of fire to habitat structure needs to be better elucidated.

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

43. How well do the following conservation efforts address the threats to the Wildlife in Savanna Grassland Habitats in Indiana?

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

44. Other current conservation practices for the Wildlife in Savanna Grassland Habitats in Indiana.

1. Fire management in savannas
(Water level management in swamp forests)

2. FIRE!!! How can this critical process not be listed as one of the standard conservation practices in your template?

Total Respondents 2

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

1. Restoration of former savanna sites.
Long-term fire management of existing savanna sites.

2. Using prescribed fire to manage savanna habitats is crucial and is not happening on nearly enough acres in the state.

Total Respondents 2

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Savanna Grassland Habitats in Indiana?

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

47. Other current HABITAT conservation practices for the Wildlife in Savanna Grassland Habitats in Indiana.

I apologize - I finally found fire in the list!

Total Respondents **1**

(skipped this question) 1

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Savanna Grassland Habitats in Indiana?

1. Purchase of remnant savannas, restoration of savannas that have undergone succession to forest or have been farmed.

2. Burn more. And get rid of the invasive species degrading savanna habitats, including those invasive species deliberately plant by wildlife agencies.

Total Respondents **2**

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

1. In many ways, savanna is a mixture of forest and grassland habitats so conserving those habitat types will aid savanna species. However, there are species, such as the Red-headed Woodpecker, that specifically benefit from oak savanna. Understanding the conservation value, for different species, of habitats along the grassland-forest gradient can help guide our allocation of resources to produce different landscape compositions.

2. This is the last one I'll have time to do and I'd like to add some general comments.
The unfortunate reality is that the biggest legacy of wildlife biologists in Indiana is the list of invasive species they have unleashed on this state. Asian bush honeysuckle, Japanese honeysuckle, multiflora rose, autumn olive - this list goes on and on. Where is the accountability for the incredible damage some species are now causing to wildlife in the state? Where is the effort to undo this damage? For those of us spending hundreds of thousands of dollars each year to control these species so that we can provide wildlife habitat in Indiana it is very disheartening to have no wildlife biologists step up and admit those species were a mistake and work alongside us to control these problems. And the phrase "Selective use of functionally equivalent exotic species in place of extirpated natives" may be the most insulting statement I've ever read. That is the whole problem with wildlife biology in this state - they think that statement makes sense!! It is time for biologists to join all the other natural resource managers on this issue.

Total Respondents **2**

6. Please rank the following threats to the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

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

7. Please also rank these threats to the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Viable reproductive population size or availability	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Degradation of							

movement/migration routes (overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**11**

8. Other threats to the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

1. Some wildlife species populations seem to be in steep decline due to habitat fragmentation (from landuse change and inappropriate management – eg – fire suppression). Most known populations seem to occur at such low densities that mating seems a remote possiblility. All the problems associated with small population size and low reproductive rate seem likely to plague the Ornate box turtle. Most populations seem likely to be in a slow-motion death spiral at the moment.

Total Respondents **1**

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

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Invasive/non-native species	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat fragmentation	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Successional change	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Habitat degradation	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Climate change	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Stream channelization	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Agricultural/forestry practices	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Residual contamination (persistent toxins)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Mining/acidification	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**18**

11. Other HABITAT threats to the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

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

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

1. Fragmentation and small habitat size – most habitats are small remnants of native grassland, surrounded by either agriculture of fire-suppressed oak savanna. Habitat size needs to be expanded at sites which support seemingly salvageable populations of the Ornate box turtle
   Much potentially suitable habitat has been lost though succession to exotic species and oak woodland. This turtle requires expansive open grassland. Lack of habitat management, or in the case of invasive species, because of the purposeful introduction of invasive shrubs, has resulted in open native grassland being lost to shrub land and oak woodland.

Total Respondents	**1**

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

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

regularly scheduled) monitoring conducted by state agencies			
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	0% (0)	100% (1)	**1**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	100% (1)	0% (0)	**1**
		Total Respondents	**8**

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

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

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

	Very crucial	**Somewhat crucial**	**Slightly crucial**	**Not crucial**	**Unknown**	**Response Total**
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**

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

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

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

Total Respondents	**8**

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

No responses were entered for this question.

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

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

No responses were entered for this question.

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

19. Please list organizations that are monitoring the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

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

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

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Coverboard routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Spot mapping	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Driving a survey route	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
Reporting from harvest, depredation, or unintentional take (road kill,	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

bycatch)							
Mark and recapture	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Professional survey/census	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
Volunteer survey/census	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Trapping (by any technique)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Representative sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Probabilistic sites	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**11**

21. Other monitoring techniques for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

1. I’m not sure if a salvageable population exists for some wildlife species in the State of Indiana. It would be critical to survey known populations to determine population structure, density and potential for recruitment. This information could then be used to plan and implement a conservation effort geared towards the ornate box turtle.

Total Respondents **1**

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

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

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

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

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

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

	These efforts are very crucial	These efforts are somewhat crucial for	These efforts are slightly	These efforts are not crucial	Unknown	Response Total

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

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

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

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

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

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in the Vegetated Dunes and Swales Grasslands Habitat in Indiana. If a technique is not applicable to the do not select a response in that row.

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

31. Other HABITAT inventory and assessment techniques for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

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

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

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

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

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

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

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

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

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

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

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

39. What are the research needs for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana?

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

40. Other research needs for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

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

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

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

42. Other HABITAT research needs for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

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

44. Other current conservation practices for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

(skipped this question) 1

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

1. Restoration of grassland habitats adjacent to known population sites would be a great start. Restoration could involve creation of native grassland system from adjacent agricultural fields, wit the restoration designed to create habitat specifically for this and other wildlife species.
Restoration of oak savanna at known sites would involve opening the canopy in oak woodlands to ~50% cover and control of invasive exotic shrubs. This would restore connectivity between potentially occupied habitat patches at larger public lands, and expand potential habitat.

Total Respondents **1**

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

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

47. Other current HABITAT conservation practices for the Wildlife in Vegetated Dunes and Swales Grasslands Habitat in Indiana.

No responses were entered for this question.

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

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

No responses were entered for this question.

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

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

1. Ornate box turtles are too often taken for granted on managed lands. Populations that were once among the best in the state may be senescent or extinct due to loss or inappropriate management of habitat. Loss of early successional native grasslands, due to uncontrolled succession or invasion of purposefully introduced invasive shrubs, are the likely culprits. Some species need to be explicitly incorporated into management plans for public lands where it still persists.

Total Respondents	**1**

6. Please rank the following threats to the Wildlife in Shrub/Scrub Habitats in Indiana.

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

7. Please also rank these threats to the Wildlife in Shrub/Scrub Habitats in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Habitat loss (feeding/foraging areas)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Near limits of natural geographic range	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	0% (0)	**4**
Large home range requirements	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Viable reproductive population size or availability	0% (0)	25% (1)	25% (1)	25% (1)	0% (0)	25% (1)	**4**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Degradation of movement/migration routes	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	0% (0)	**4**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	25% (1)	0% (0)	25% (1)	50% (2)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**4**

8. Other threats to the Wildlife in Shrub/Scrub Habitats in Indiana.

1. In addition to habitat loss another problem is natural succession in the remaining shrub/scrub habitats.

2. Unknown

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

9. Please briefly describe the top two threats to the Wildlife in Shrub/Scrub Habitats in Indiana identified above.

Loss of the habitat in general would be the greatest threat and natural succession of the remaining habitat would be a secondary threat.

2. Habitat loss to development and farming (esp. brooding areas, foraging areas, and escape cover)
Predators (esp. domesticated animals)

3. Habitat loss due to human/economic growth factors.
Lack of management to maintain/create these types of habitats.

4. 1. General habitat loss due to clean farming practices and residential development.
2. Isolation of habitat or islands of habitat with no connecting travel lanes.

Total Respondents	**4**

10. Please rank the following threats to the HABITAT of the Wildlife in Shrub/Scrub Habitats in Indiana.

	Critical threat	**Serious threat**	**Somewhat of a threat**	**Slight threat**	**No threat**	**Unknown**	**Response Total**
Commercial or residential development (sprawl)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	25% (1)	50% (2)	25% (1)	0% (0)	**4**
Invasive/non-native species	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Nonpoint source pollution (sedimentation and nutrients)	0% (0)	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Habitat fragmentation	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Successional change	50% (2)	25% (1)	25% (1)	0% (0)	0% (0)	0% (0)	**4**

Diseases (of plants that create habitat)	0% (0)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Habitat degradation	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Climate change	0% (0)	0% (0)	25% (1)	0% (0)	0% (0)	75% (3)	**4**
Stream channelization	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Impoundment of water/flow regulation	0% (0)	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	**4**
Agricultural/forestry practices	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Residual contamination (persistent toxins)	0% (0)	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Point source pollution (continuing)	0% (0)	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	**4**
Mining/acidification	0% (0)	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	**4**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**4**

11. Other HABITAT threats to the Wildlife in Shrub/Scrub Habitats in Indiana.

Unknown

Total Respondents **1**

(skipped this question) 3

12. Please briefly describe the top two HABITAT threats to the Wildlife in Shrub/Scrub Habitats in Indiana identified above.

1. Successional change and fragmentation are the 2 greatest threats on the previous list

2. Any changes in farming practices that causes the loss of escape cover (including treeline, fenceline, and wood's edge).
Habitat loss to development.

3. Ag/Forestry practices - Lack of active management to create/maintain these types of habitats.
Successional change - Due to lack of mgt./disturbance of vegetation.

4. 1. Destruction of habitat by commercial and residential development.
2. Habitat fragmentation that limits seasonal movements and population expansion.

Total Respondents **4**

13. What current monitoring efforts by state agencies are you aware of for the Wildlife in Shrub/Scrub Habitats in Indiana?

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

14. What current monitoring efforts by other organizations are you aware of for the Wildlife in Shrub/Scrub Habitats in Indiana?

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

15. How crucial are these monitoring efforts by state agencies for the conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

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

16. How crucial are these monitoring efforts by other organizations for the conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

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

17. Regional or local state agency monitoring for the Wildlife in Shrub/Scrub Habitats in Indiana.

1. The Indiana Division of Fish and Wildlife (INDFW) conducts annual spring whistle counts on 77 established routes across the state. The INDFW also conducts biennial surveys of small game license holders to assess bobwhite harvest. However, neither of these surveys are focues directly towards shrub/scrub habitat.

2. Routes ran throughout the state by Division of Fish and Wildlife biologists.

3. Quail Whistling counts - in selected counties
Hunter/Harvest surveys - by geographic regions
Bird Breeding survey - survey blocks

4. Winamac FWA conducts annual bobwhite whistle call survey on that property.

Total Respondents **4**

18. Regional or local monitoring by other organizations for the Wildlife in Shrub/Scrub Habitats in Indiana.

1. Quail Unlimited chapters

2. Not aware of any.

3. Unknown

Total Respondents **3**

(skipped this question) 1

19. Please list organizations that are monitoring the Wildlife in Shrub/Scrub Habitats in Indiana.

1. The National Audubon Society conducts the annual breeding bird survey.

2. Quail Unlimited

3. IDNR/Division of Fish & Wildlife

4. Unknown

Total Respondents **4**

20. What are the current monitoring techniques for the Wildlife in Shrub/Scrub Habitats in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	0% (0)	**4**
Modeling	0% (0)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Coverboard routes	0% (0)	0% (0)	50% (1)	0% (0)	0% (0)	50% (1)	**2**
Spot mapping	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Driving a survey route	100% (4)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	100% (4)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**4**
Mark and recapture	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Professional survey/census	50% (2)	0% (0)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
Volunteer survey/census	0% (0)	33% (1)	67% (2)	0% (0)	0% (0)	0% (0)	**3**
Trapping (by any technique)	0% (0)	0% (0)	75% (3)	0% (0)	25% (1)	0% (0)	**4**
Representative sites	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Probabilistic sites	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
						Total Respondents	**4**

21. Other monitoring techniques for the Wildlife in Shrub/Scrub Habitats in Indiana.

Unknown

Total Respondents	**1**
(skipped this question)	3

22. What one or two monitoring techniques would you recommend for effective conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

1. I would like to see a radio telemetry study of bobwhites in Indiana because we are lacking most of the baseline data for bobwhites in Indiana. Much of the information we use to manage quail populations comes from studies in other states. I think the whistle counts that are already conducted provide a less intensive (but important) method of tracking the statewide population.

2. Survey Routes

3. Annual Quail Whistling Counts
Annual Hunter/Harvest Surveys

4. 1. Harvest survey
2. Whistle call survey

Total Respondents **4**

23. What current HABITAT inventory and assessment efforts or activities by state agencies are you aware of for the Wildlife in Shrub/Scrub Habitats in Indiana?

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

24. What current HABITAT inventory and assessment efforts or activities by other organizations are you aware of for the Wildlife in Shrub/Scrub Habitats in Indiana?

	Yes, these efforts occur	No effort that I'm aware of	Response Total

Statewide year-round inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Regional or local year-round inventory and assessment conducted by other organizations	25% (1)	75% (3)	**4**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (3)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	0% (0)	100% (4)	**4**
		Total Respondents	**4**

25. How crucial are these HABITAT efforts by state agencies for the conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

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

26. How crucial are these HABITAT efforts by other organizations for the conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

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

Total Respondents	**4**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in Shrub/Scrub Habitats in Indiana.

1. I am not aware of any agency monitoring this habitat type but I would like to see remotely sensed data used to track statewide and regional changes in acreage over the last 30+ years.

2. Statewide

3. Unknown

Total Respondents	**3**
(skipped this question)	1

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in Shrub/Scrub Habitats in Indiana.

1. I'm not aware of any other agency monitoring this habitat type but it is likely that one of the state universities has remotely sensed data that could be used to monitor changes in acreage over a number of years.

2. Unknown

3. Statewide by regions

4. Unknown

Total Respondents	**4**

29. Please list organizations that are monitoring this HABITAT for the Wildlife in Shrub/Scrub Habitats in Indiana.

1. Quail Unlimited

2. USDA/Forest Service/NC Research Station

3. Unknown

Total Respondents	**3**
(skipped this question)	1

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Shrub/Scrub Habitats in Indiana?

If a technique is not applicable to the Wildlife in Shrub/Scrub Habitats, do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing	Not used and not possible with existing	Not economically feasible	Unknown	Response Total

			technology and data	technology and data			
GIS mapping	25% (1)	25% (1)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
Aerial photography and analysis	0% (0)	50% (2)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
Systematic sampling	0% (0)	0% (0)	33% (1)	0% (0)	0% (0)	67% (2)	**3**
Property tax estimates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
State revenue data	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Regulatory information	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (2)	**2**
Participation in landuse programs	33% (1)	33% (1)	0% (0)	0% (0)	0% (0)	33% (1)	**3**
Modeling	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Voluntary landowner reporting	0% (0)	0% (0)	67% (2)	0% (0)	0% (0)	33% (1)	**3**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**4**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Shrub/Scrub Habitats in Indiana.

Unknown

Total Respondents **1**

(skipped this question) 3

32. What one or two HABITAT inventory and assessment techniques would you recommend for effective conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

1. I would like to see remotely sensed data used to monitor changes in statewide and regional acreage and distribution. It would be interesting and useful to see how trends in shrub/scrub habitat relate to the INDFW bobwhite whistle indices.

2. Participation in land use programs.

3. GIS analysis of habitat types

4. Unknown

Total Respondents **4**

33. What is the current body of science for the Wildlife in Shrub/Scrub Habitats in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		1	25%
Inadequate		2	50%
Nonexistent		0	0%
Other (please explain below)	Inadequate - Most research not specific to Indiana	1	25%
	Total Respondents		4

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

Title = Bobwhite Quail Investigation
Author = Maurice C. Reeves
Date = 1954
Publisher = Indiana Department of Conservation

Title = 2003 Breeding Population Index of Northern Bobwhite Quail
Author = James C. Pitman
Date = July 16, 2004
Publisher = IDNR F&W

Title = Unknown/Quail Investigations
Author = Maurice Reeves
Date = Unknown/Old
Publisher = IDNR/Divsion of Fish & Wildlife

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

Title = On the edge: a guide to managing for bobwhite quail
Author = T. Dailey and T. Hutton
Date = 2003
Publisher = Missouri Department of Conservation

Title = Population Ecology of the Bobwhite
Author = John L Roseberry
Date = 1984
Publisher = SIU Press

36. What is the current HABITAT body of science for the Wildlife in Shrub/Scrub Habitats in Indiana?

	Response Total	Response Percent
Complete, up to date and extensive	0	0%
Adequate	1	25%
Inadequate	2	50%
Nonexistent	1	25%
Other (please explain below)	0	0%
Total Respondents		4

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

Title = Some Aspects of the Relationship between Land and Utilization and Bobwhite Quail
Author = John L. Roseberry
Date = 1960
Publisher = SIU Press

Title = Population Ecology of the Bobwhite
Author = John L Roseberry
Date = 1984
Publisher = SIU Press

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

Title = The Bobwhite Quail - Its Life and Management
Author = Walter Rosene
Date = 1969
Publisher = Rutgers University Press

39. What are the research needs for the Wildlife in Shrub/Scrub Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	25% (1)	25% (1)	25% (1)	25% (1)	0% (0)	0% (0)	4
Distribution and abundance	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	0% (0)	4
Limiting factors (food, shelter, water, breeding sites)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	4
Threats (predators/competition, contamination)	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	0% (0)	4

Relationship/dependence on specific habitats	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	0% (0)	**4**
Population health (genetic and physical)	25% (1)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**4**

40. Other research needs for the Wildlife in Shrub/Scrub Habitats in Indiana.

Dispersal and repopulation methods of isolated habitats.

Total Respondents	**1**
(skipped this question)	3

41. What are the HABITAT research needs for the Wildlife in Shrub/Scrub Habitats in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	40% (2)	60% (3)	0% (0)	0% (0)	0% (0)	**5**
Distribution and abundance (fragmentation)	20% (1)	60% (3)	20% (1)	0% (0)	0% (0)	0% (0)	**5**
Threats (land use change/competition, contamination/global warming)	0% (0)	80% (4)	0% (0)	20% (1)	0% (0)	0% (0)	**5**
Relationship/dependence on specific site conditions	0% (0)	50% (2)	50% (2)	0% (0)	0% (0)	0% (0)	**4**
Growth and development of individual components of the habitat	0% (0)	40% (2)	20% (1)	20% (1)	20% (1)	0% (0)	**5**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
						Total Respondents	**4**

42. Other HABITAT research needs for the Wildlife in Shrub/Scrub Habitats in Indiana.

Location and distribution of shrub/scrub habitat.

Total Respondents	**1**
(skipped this question)	3

43. How well do the following conservation efforts address the threats to the Wildlife in Shrub/Scrub Habitats in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total

Habitat protection (use below for details)	25% (1)	75% (3)	0% (0)	0% (0)	0% (0)	**4**
Population management (hunting, trapping)	25% (1)	50% (2)	25% (1)	0% (0)	0% (0)	**4**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	50% (2)	50% (2)	0% (0)	**4**
Reintroduction (restoration)	0% (0)	0% (0)	25% (1)	25% (1)	50% (2)	**4**
Food plots	25% (1)	50% (2)	0% (0)	0% (0)	25% (1)	**4**
Threats reduction	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Native predator control	0% (0)	25% (1)	0% (0)	50% (2)	25% (1)	**4**
Exotic/invasive species control	0% (0)	50% (2)	25% (1)	0% (0)	25% (1)	**4**
Regulation of collecting	0% (0)	50% (2)	0% (0)	50% (2)	0% (0)	**4**
Disease/parasite management	0% (0)	0% (0)	0% (0)	25% (1)	75% (3)	**4**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	50% (2)	50% (2)	**4**
Protection of migration routes	0% (0)	0% (0)	50% (2)	25% (1)	25% (1)	**4**
Limiting contact with pollutants/contaminants	0% (0)	25% (1)	25% (1)	25% (1)	25% (1)	**4**
Public education to reduce human disturbance	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (4)	0% (0)	**4**
Stocking	0% (0)	0% (0)	25% (1)	75% (3)	0% (0)	**4**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
				Total Respondents		**4**

44. Other current conservation practices for the Wildlife in Shrub/Scrub Habitats in Indiana.

Unknown

Total Respondents	**1**
(skipped this question)	3

45. What one or two specific practices would you recommend for more effective conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

1. The most important practice that would benefit bobwhites in shrub/scrub habitat would be to spend more time educating the public about what constitutes suitable quail habitat.

2. Restoration of Habitat

3. Habitat protection, development and maintenance.

4. 1. Establishment of more shrub/scrub habitat.
2. Vegetative succession control to provide early successional plant species.

Total Respondents	**4**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in Shrub/Scrub Habitats in Indiana?

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

47. Other current HABITAT conservation practices for the Wildlife in Shrub/Scrub Habitats in Indiana.

Unknown

Total Respondents	**1**
(skipped this question)	3

48. What one or two specific HABITAT practices would you recommend for more effective conservation of the Wildlife in Shrub/Scrub Habitats in Indiana?

1. Setting back succession with burning or disking are the 2 most productive habitat practices. The INDFW already provides financial incentive to maintain or establish bobwhite habitat on priveate land. These incentives do help some to

provide quality bobwhite habitat.

2. More incentives to restore habitat.

3. Woodland edge feathering
Shrub corridor/hedgerow development

4. 1. Provide financial incentives to establish habitat.
2. Technical assistance to maintain habitat in shrub/scrub type.

Total Respondents **4**

49. Do you have any additional comments or information on the Wildlife in Shrub/Scrub Habitats that you feel would be useful in the development of the Indiana Comprehensive Wildlife Strategy?

1. Shrub/scrub habitats alone will not support a viable Northern Bobwhite population. Other essential habitats would include: wildlife friendly clump grasses/legumes/forbs, annual crops and/or moderately disturbed ground. All of these habitat types must be in close proximity to shrub/scrub habitats to meet the birds living requirements.

2. None.

Total Respondents **2**

(skipped this question) 2

6. Please rank the following threats to the Wildlife in All subterranean systems Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Invasive/non-native species	0% (0)	14% (1)	0% (0)	29% (2)	57% (4)	0% (0)	**7**
High sensitivity to pollution	14% (1)	14% (1)	14% (1)	14% (1)	0% (0)	43% (3)	**7**
Bioaccumulation of contaminants	0% (0)	43% (3)	0% (0)	14% (1)	0% (0)	43% (3)	**7**
Predators (native or domesticated)	0% (0)	0% (0)	29% (2)	57% (4)	0% (0)	14% (1)	**7**
Dependence on other species (mutualism, pollinators)	0% (0)	0% (0)	0% (0)	0% (0)	71% (5)	29% (2)	**7**
Diseases/parasites (of the species itself)	0% (0)	0% (0)	14% (1)	14% (1)	29% (2)	43% (3)	**7**
Regulated hunting/fishing pressure (too much)	0% (0)	0% (0)	0% (0)	0% (0)	100% (7)	0% (0)	**7**
Species over population	0% (0)	0% (0)	0% (0)	0% (0)	100% (7)	0% (0)	**7**
Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)	0% (0)	29% (2)	0% (0)	57% (4)	0% (0)	14% (1)	**7**
Unregulated collection pressure	0% (0)	0% (0)	14% (1)	29% (2)	43% (3)	14% (1)	**7**
Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)	0% (0)	0% (0)	29% (2)	43% (3)	14% (1)	14% (1)	**7**
					Total Respondents		**77**

7. Please also rank these threats to the Wildlife in All subterranean systems Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	29% (2)	29% (2)	43% (3)	0% (0)	0% (0)	0% (0)	**7**
Habitat loss (feeding/foraging areas)	14% (1)	43% (3)	43% (3)	0% (0)	0% (0)	0% (0)	**7**
Small native range (high endemism)	14% (1)	14% (1)	0% (0)	43% (3)	29% (2)	0% (0)	**7**
Near limits of natural geographic range	14% (1)	0% (0)	14% (1)	0% (0)	71% (5)	0% (0)	**7**
Large home range requirements	0% (0)	0% (0)	14% (1)	14% (1)	71% (5)	0% (0)	**7**
Viable reproductive population size or availability	0% (0)	0% (0)	29% (2)	29% (2)	14% (1)	29% (2)	**7**
Specialized reproductive behavior or low reproductive rates	14% (1)	29% (2)	43% (3)	0% (0)	0% (0)	14% (1)	**7**
Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)	14% (1)	43% (3)	0% (0)	14% (1)	14% (1)	14% (1)	**7**

Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	29% (2)	71% (5)	**7**
Unknown	0% (0)	33% (1)	0% (0)	0% (0)	0% (0)	66% (2)	**3**
Other (please specify below)	50% (1)	0% (0)	50% (1)	0% (0)	0% (0)	0% (0)	**2**
					Total Respondents		**68**

8. Other threats to the Wildlife in All subterranean systems Habitat in Indiana.

1. Loss of forest habitat surrounding winter hibernacula/caves.

2. With reference to "unregulated collection pressure," I included disturbance related to research/monitoring.

3. Unregulated Human Activity in Hibernacula

4. needs caves or mines for hibernationwithin probably 60 miles of its summering ground

Total Respondents **4**

9. Please briefly describe the top two threats to the Wildlife in All subterranean systems Habitat in Indiana identified above.

1. Human disturbance of hibernating bats (e.g., Ray's Cave in Greene Co.)
Alterations to microclimate within hibernacula

2. -Some traditional hibernacula have been rendered unsuitable or degraded due to cave development/commercialization (including disturbance of hibernating bats by human visitation), modication of the cave environment, or alternation of surface features.
-Threats also occur on summer habitat (not addressed here because it is not captured within the "cave habitat" category).

3. Human disturbance of active hibernacula

Loss of typical maternal roosting structures (large snags with sloughing bark)

4. The major two threats are loss of summer and winter (caves) habitat. In addition, education of cavers and continued improvments to cave gates are important to the Indiana bat survival

5. 1. Non-point sources of pollution, especially sediments and pesticides
2. Point sources of pollution particularly sewage and spills of chemicals being transported along roads and railroads

6. Oxidus gracilis is a non-native carnivorous millipede invading caves in the east; it is now in several Indiana caves and is preying on the food base for cave salamanders. Further east, reports of greatly decreased insect diversity in caves invaded by this millipide have been reported. Potential impact is unknown, but could be significant.

Total Respondents **6**

10. Please rank the following threats to the HABITAT of the Wildlife in All subterranean systems Habitat in Indiana.

Appendix E-60: Aggregated Subterranean Systems

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Commercial or residential development (sprawl)	14% (1)	43% (3)	43% (3)	0% (0)	0% (0)	0% (0)	**7**
Counterproductive financial incentives or regulations	0% (0)	0% (0)	0% (0)	29% (2)	43% (3)	29% (2)	**7**
Invasive/non-native species	0% (0)	0% (0)	29% (2)	14% (1)	57% (4)	0% (0)	**7**
Nonpoint source pollution (sedimentation and nutrients)	17% (1)	0% (0)	50% (3)	0% (0)	17% (1)	17% (1)	**6**
Habitat fragmentation	14% (1)	14% (1)	43% (3)	29% (2)	0% (0)	0% (0)	**7**
Successional change	0% (0)	0% (0)	14% (1)	29% (2)	57% (4)	0% (0)	**7**
Diseases (of plants that create habitat)	0% (0)	0% (0)	0% (0)	14% (1)	57% (4)	29% (2)	**7**
Habitat degradation	29% (2)	29% (2)	43% (3)	0% (0)	0% (0)	0% (0)	**7**
Climate change	14% (1)	14% (1)	29% (2)	14% (1)	0% (0)	29% (2)	**7**
Stream channelization	0% (0)	14% (1)	14% (1)	29% (2)	29% (2)	14% (1)	**7**
Impoundment of water/flow regulation	0% (0)	14% (1)	14% (1)	29% (2)	29% (2)	14% (1)	**7**
Agricultural/forestry practices	0% (0)	43% (3)	43% (3)	14% (1)	0% (0)	0% (0)	**7**
Residual contamination (persistent toxins)	0% (0)	14% (1)	57% (4)	0% (0)	0% (0)	29% (2)	**7**
Point source pollution (continuing)	0% (0)	29% (2)	29% (2)	14% (1)	0% (0)	29% (2)	**7**
Mining/acidification	0% (0)	0% (0)	57% (4)	0% (0)	29% (2)	14% (1)	**7**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	14% (1)	57% (4)	14% (1)	14% (1)	**7**
Unknown	0% (0)	0% (0)	33% (1)	0% (0)	33% (1)	33% (1)	**3**
Other (please specify below)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	0% (0)	**1**
					Total Respondents		**114**

11. Other HABITAT threats to the Wildlife in All subterranean systems Habitat in Indiana.

1. Dumping of refuse in sinkholes, these often contain persistent toxins associated with transformers, tires, appliances, pesticide containers, and electronic devices.

2. needs caves or mines as indicated above; Pesticides could be a major threat, for this onther bats, but unknown for sure

Total Respondents **2**

12. Please briefly describe the top two HABITAT threats to the Wildlife in All subterranean systems Habitat in Indiana identified above.

1. Adverse modifications to cave entrances (e.g., poorly designed bat gates), which cause a change in interior microclimates/temperatures.

Loss/degradation/fragmentation of forested areas surrounding caves used by bats during the fall swarming period.

2. Loss/degradation of traditional hibernacula.

loss, fragmentation and degradation of breeding habitat (note that breeding habitat also occurs in areas of the state not associated with caves)

3. The top two threats are habitat degradation of caves by potential migration of chemicals which alter the cave ecosystem, and the loss of roost trees via a number of man-related activities (commercial, agricultural, etc.)

4. Both non-point and point sources of pollution associated with the increasing human population of Southern Indiana and the development of the area.

5. habitat disappearing to development
needs caves and mines for hibernation

6. Forestry practices that open the forest canopy around cave entrances can greatly impact the habitat for some wildlife species, drying out the entrance to the point it is not useable habitat by the salamanders.

Total Respondents **6**

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

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	100% (7)	**7**
Statewide once a year monitoring conducted by state agencies	0% (0)	100% (7)	**7**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	71% (5)	29% (2)	**7**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	14% (1)	86% (6)	**7**
Regional or local year-round monitoring conducted by state agencies	0% (0)	100% (7)	**7**
Regional or local once a year monitoring conducted by state agencies	0% (0)	100% (7)	**7**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	29% (2)	71% (5)	**7**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	14% (1)	86% (6)	**7**
		Total Respondents	**56**

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

	Yes, these efforts occur	Not aware of these efforts occuring	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Statewide once a year monitoring conducted by other organizations	14% (1)	86% (6)	**7**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	29% (2)	71% (5)	**7**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	14% (1)	86% (6)	**7**
Regional or local year-round monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Regional or local once a year monitoring conducted by other organizations	0% (0)	100% (7)	**7**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	14% (1)	86% (6)	**7**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	29% (2)	71% (5)	**7**
		Total Respondents	**56**

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

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	80% (4)	20% (1)	**5**
Statewide once a year monitoring conducted by state agencies	0% (0)	20% (1)	0% (0)	60% (3)	20% (1)	**5**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by state agencies	43% (3)	14% (1)	14% (1)	14% (1)	14% (1)	**7**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by state agencies	0% (0)	17% (1)	0% (0)	50% (3)	33% (2)	**6**
Regional or local year-round monitoring conducted by state agencies	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Regional or local once a year monitoring conducted by state agencies	0% (0)	20% (1)	0% (0)	80% (4)	0% (0)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by state agencies	60% (3)	0% (0)	0% (0)	40% (2)	0% (0)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by state agencies	17% (1)	17% (1)	0% (0)	67% (4)	0% (0)	**6**

Total Respondents 44

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

	Very crucial	Somewhat crucial	Slightly crucial	Not crucial	Unknown	Response Total
Statewide year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	80% (4)	20% (1)	**5**
Statewide once a year monitoring conducted by other organizations	0% (0)	17% (1)	0% (0)	67% (4)	17% (1)	**6**
Periodic statewide (less than once a year but still regularly scheduled) monitoring conducted by other organizations	33% (2)	33% (2)	17% (1)	0% (0)	17% (1)	**6**
Occasional statewide (less than once a year and not regularly scheduled) monitoring conducted by other organizations	0% (0)	17% (1)	0% (0)	67% (4)	17% (1)	**6**
Regional or local year-round monitoring conducted by other organizations	0% (0)	0% (0)	0% (0)	100% (5)	0% (0)	**5**
Regional or local once a year monitoring conducted by other organizations	0% (0)	20% (1)	0% (0)	80% (4)	0% (0)	**5**
Periodic regional or local (less than once a year but still regularly scheduled) monitoring conducted by other organizations	60% (3)	0% (0)	0% (0)	40% (2)	0% (0)	**5**
Occasional regional or local (less than once a year and not regularly scheduled) monitoring conducted by other organizations	17% (1)	17% (1)	0% (0)	67% (4)	0% (0)	**6**

Total Respondents 44

17. Regional or local state agency monitoring for the Wildlife in All subterranean systems Habitat in Indiana.

1. All known I-bat hibernacula

2. -The IDNR conducts biennial hibernacula surveys in all known Indiana bat hibernacula in the state (except Batwing and Twin Domes Caves, which are surveyed under a separate Federal contract).
-Occassional monitoring/research is conducted in cave habitats on a localized basis by State agencies for specific purposes (such as the swarming habitat study at Wyandotte cave).
-Monitoring is also occasionally conducted in summer habitat (not included in this survey).

3. Caves in southern Indiana are monitored. Currently there are 33 hibernacula reported for the Indiana bat in southern Indiana. This confidential information is available upon request.

4. unkown

Total Respondents 4

18. Regional or local monitoring by other organizations for the Wildlife in All subterranean systems Habitat in Indiana.

1. Rick Clawson, Missouri DOC, conducts the bienniel winter surveys at Twin Domes and Batwing caves. The Indiana Karst Conservancy (Keith Dunlap) also assists with monitoring efforts, especially at hibernacula that they own or oversee. I have monitored the I-bat population in Reeves Cave in Monroe County.

2. There are surveys conducted at localized locations throughout the State of Indiana, primarily in summer habitat but also some cave habitat work, to address specific management or research needs. For example, surveys are conducted at all Department of Defense properties in the State.

3. See #17.

4. University of Louisville has been monitoring some wildlife species at irregular intervals and locations in southern Indiana since 1994

5. Biyearly monitoring for cave bats in about 18 caves in which Indiana myotis is known to hibernate.

Total Respondents **5**

19. Please list organizations that are monitoring the Wildlife in All subterranean systems Habitat in Indiana.

1. Indiana DNR(Dr. Virgil Brack/ESI, Keith Dunlap, Scott Johnson), Indiana Karst Conservancy, local NSS Grotto members, and U.S. Fish and Wildlife Service

2. Federal agencies (e.g., Forest Service, DoD, COE)
Educational institutions (e.g., Purdue, ISU)
Local/County agencies
Private Conservation Organizations (e.g., Indiana Karst Conservancy)

3. IDNR, USFWS, Indiana Karst Conservancy, Indiana Cave Survey, various ecological consultants and universities (federal permit holders)

4. University of Louisville, Biology Department

5. Virgil Brack and company.

Total Respondents **5**

20. What are the current monitoring techniques for the Wildlife in All subterranean systems Habitat in Indiana?

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
Radio telemetry and tracking	29% (2)	29% (2)	0% (0)	14% (1)	0% (0)	29% (2)	**7**
Modeling	0% (0)	33% (2)	33% (2)	0% (0)	0% (0)	33% (2)	**6**

Coverboard routes	0% (0)	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	**4**
Spot mapping	0% (0)	0% (0)	25% (1)	25% (1)	0% (0)	50% (2)	**4**
Driving a survey route	0% (0)	0% (0)	0% (0)	50% (2)	0% (0)	50% (2)	**4**
Reporting from harvest, depredation, or unintentional take (road kill, bycatch)	25% (1)	25% (1)	0% (0)	0% (0)	0% (0)	50% (2)	**4**
Mark and recapture	14% (1)	29% (2)	14% (1)	29% (2)	0% (0)	14% (1)	**7**
Professional survey/census	50% (3)	17% (1)	0% (0)	0% (0)	0% (0)	33% (2)	**6**
Volunteer survey/census	20% (1)	60% (3)	0% (0)	0% (0)	0% (0)	20% (1)	**5**
Trapping (by any technique)	71% (5)	0% (0)	0% (0)	0% (0)	0% (0)	29% (2)	**7**
Representative sites	33% (2)	17% (1)	17% (1)	0% (0)	0% (0)	33% (2)	**6**
Probabilistic sites	50% (2)	0% (0)	0% (0)	0% (0)	0% (0)	50% (2)	**4**
Other (please specify below)	0% (0)	50% (2)	25% (1)	0% (0)	0% (0)	25% (1)	**4**
					Total Respondents		**68**

21. Other monitoring techniques for the Wildlife in All subterranean systems Habitat in Indiana.

1. AnaBat/acoustic and/or video monitoring of cave entrances to assess bat presence/use.

2. Stable isotope analysis, genetic genotyping of individuals (through guano analysis), thermal imagery surveys, contaminant analysis/monitoring through guano and/or whole body analysis

3. The use of Anabat as appropriate. Anabat is a bat detector that uses vocalizations to identify species.

4. Delury or Survey/Removal techniques have been used at Donaldson Cave in the 1990's

5. mist-netting stream
cave counts
rabies lab bats
trapping cave and mine entrances

Total Respondents **5**

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

1. Continue ongoing bienniel winter surveys at all known hibernacula.

2. -Biennial hibernacula surveys (which I would classify as "professional survey/census"), are the only means currently available to track Indiana bat population trends on a statewide or rangewide basis. These surveys are conducted rangewide.
-Survey and monitoring activities conducted in summer habitat are used to: 1) evaluate summer distribution in the state, and 2) evaluate roosting and foraging habitat use/needs. These surveys are conducted in Indiana as well as other states throughout the range of the species.

3. 1) Hibernacula counts to track population levels (Already being done)
2) Intensive radiotelemetry that tracks roost and foraging movements of specific colonies in representative areas across the state.

4. Trapping for Indiana bat includes mist netting and harp trapping. Internal cave surveys are important and more emphasis should be placed on the use of Anabat.

5. Development of an index of biotic integrity (IBI) for vertebrate cave communities in southern Indiana.
Selection of 5-10 locations for survey/counts every2-5 years. A similar survey schedule has been established for cavefish populations in Mammoth Cave National Park and could be used as a model (both IBI and survey).

6. the first 3 of the above.

Total Respondents **6**

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

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	100% (6)	**6**
Statewide once a year inventory and assessment conducted by state agencies	17% (1)	83% (5)	**6**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	67% (4)	33% (2)	**6**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (2)	67% (4)	**6**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	100% (6)	**6**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	100% (6)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	17% (1)	83% (5)	**6**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (2)	67% (4)	**6**
		Total Respondents	**48**

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

	Yes, these efforts occur	No effort that I'm aware of	Response Total
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	100% (6)	**6**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	100% (6)	**6**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	50% (3)	50% (3)	**6**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	17% (1)	83% (5)	**6**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	100% (6)	**6**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	100% (6)	**6**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	17% (1)	83% (5)	**6**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	33% (2)	67% (4)	**6**
	Total Respondents		**48**

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

	These efforts are very crucial for this HABITAT	These efforts are somewhat crucial for this HABITAT	These efforts are slightly crucial for this HABITAT	These efforts are not crucial for this HABITAT	Unknown	Response Total
Statewide annual inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Statewide once a year inventory and assessment conducted by state agencies	25% (1)	0% (0)	0% (0)	25% (1)	50% (2)	**4**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	67% (4)	0% (0)	0% (0)	0% (0)	33% (2)	**6**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	33% (2)	17% (1)	0% (0)	17% (1)	33% (2)	**6**
Regional or local year-round inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Regional or local once a year inventory and assessment conducted by state agencies	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by state agencies	25% (1)	25% (1)	0% (0)	0% (0)	50% (2)	**4**

Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by state agencies	25% (1)	50% (2)	0% (0)	25% (1)	0% (0)	**4**
				Total Respondents		**33**

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

	These efforts are very crucial for this HABITAT	**These efforts are somewhat crucial for this HABITAT**	**These efforts are slightly crucial for this HABITAT**	**These efforts are not crucial for this HABITAT**	**Unknown**	**Response Total**
Statewide year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Statewide once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	60% (3)	0% (0)	0% (0)	0% (0)	40% (2)	**5**
Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	40% (2)	0% (0)	0% (0)	20% (1)	40% (2)	**5**
Regional or local year-round inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Regional or local once a year inventory and assessment conducted by other organizations	0% (0)	0% (0)	0% (0)	33% (1)	66% (2)	**3**
Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment conducted by other organizations	25% (1)	0% (0)	0% (0)	25% (1)	50% (2)	**4**
Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment conducted by other organizations	50% (2)	25% (1)	0% (0)	25% (1)	0% (0)	**4**
				Total Respondents		**30**

27. Regional or local state agency HABITAT inventory and assessment for the Wildlife in All subterranean systems Habitat in Indiana.

1. cave habitat is assessed when the winter surveys of hibernacula are conducted state-wide.

2. -State conducted annual monitoring of the cave environment in most major hibernacula. Human disturbance in key hibernacula is also monitored.
-The contractor who conducts the biennial hibernacula surveys also documents information on cave "condition" (e.g., breakdown) and makes management recommendations.

3. Karst regions and summer habitat in Indiana

4. south central part of state

5. DFW - nongame

Total Respondents 5

28. Regional or local HABITAT inventory and assessment by other organizations for the Wildlife in All subterranean systems Habitat in Indiana.

1. completed by Rick Clawson, Missouri DOC, for Twin Domes and Batwing caves. USFWS- Reeves Cave and others

2. Several organizations coollect information on the location and condition of caves, as well as the presence of bats in caves, which provides useful information.

3. Karst regions and summer habitat in Indiana

4. Hoosier National Forest
Harrison/Crawford State Forest
Spring Mill State Park
Caves of south/central Indiana

5. south central part of state

6. Indiana Karst Conservancy and local grottos

Total Respondents 6

29. Please list organizations that are monitoring this HABITAT for the Wildlife in All subterranean systems Habitat in Indiana.

1. Indiana Karst Conservancy, NSS Grottos, USFWS, I-69 bat consultants

2. IKC, TNC, USGS, Indiana Cave Survey, USFS

3. IDNR, USFWS, Indiana Karst Conservancy, Indiana Cave Survey, ecological consultants and universities (federal permit holders)

4. U.S. Forest Service
Indiana DNR
University of Louisville

5. Virgil Brack and his company

6. Indiana Karst Conservancy and local grottos

Total Respondents 6

30. What are the current monitoring techniques for the Wildlife in All subterranean systems Habitat in Indiana?

If a technique is not applicable to the Wildlife in All subterranean systems Habitat do not select a response in that row.

	Frequently used	Occasionally used	Not used but possible with existing technology and data	Not used and not possible with existing technology and data	Not economically feasible	Unknown	Response Total
GIS mapping	14% (1)	43% (3)	0% (0)	14% (1)	0% (0)	29% (2)	**7**
Aerial photography and analysis	0% (0)	50% (3)	0% (0)	17% (1)	0% (0)	33% (2)	**6**
Systematic sampling	33% (2)	17% (1)	17% (1)	17% (1)	0% (0)	17% (1)	**6**
Property tax estimates	0% (0)	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	**4**
State revenue data	0% (0)	0% (0)	0% (0)	25% (1)	0% (0)	75% (3)	**4**
Regulatory information	40% (2)	0% (0)	0% (0)	20% (1)	0% (0)	40% (2)	**5**
Participation in landuse programs	0% (0)	0% (0)	20% (1)	20% (1)	0% (0)	60% (3)	**5**
Modeling	0% (0)	33% (2)	33% (2)	17% (1)	0% (0)	17% (1)	**6**
Voluntary landowner reporting	20% (1)	20% (1)	0% (0)	20% (1)	0% (0)	40% (2)	**5**
Other (please specify below)	50% (1)	0% (0)	0% (0)	0% (0)	0% (0)	50% (1)	**2**
					Total Respondents		**50**

31. Other HABITAT inventory and assessment techniques for the Wildlife in All subterranean systems Habitat in Indiana.

1. Temperature and Relative Humidity monitoring with remote dataloggers.

2. cave survey

3. Visual estimation - has the entrance been changed in anyway from its historical configuration (forest canopy opened up, entrance enlarged or blocked, etc.)

Total Respondents **3**

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

1. Cave microclimate monitoring with dataloggers should continue. A range-wide protocol for monitoring cave temperature and humidity has been developed by Bat Conservation International and is being widely used (contact Jim Kennedy or Merlin Tuttle at BCI). I believe Scott Johnson has been following this protocol in Indiana.

2. -Cave microclimate data used in conjunction with results of hibernacula surveys.
-Techniques to link summer/winter populations (new genetic techniques such as stable isotope analysis; pit tagging).
-Information on habitat use/needs in the vicinity of caves during swarming is a critical need. At present, radio telemetry represents the best potential to collect this information.

3. Population surveys every five years and development of an IBI to be applied at 5-10 critical locations. These to include Blue Spring Caverns, Spring Mill State Park, and Harrison/Crawford State Forest

4. cave survey in winter, and net survey in summer

Total Respondents **4**

33. What is the current body of science for the Wildlife in All subterranean systems Habitat in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		1	14%
Inadequate		4	57%
Nonexistent		0	0%
Other (please explain below)	1. There is lots of research, but also great need due to endangered status. 2. Somewhere between Adequate & Inadequate	2	29%
	Total Respondents		7

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

		Response Total	Response Percent
Title	1, Distribution and status of the northern cavefish 2. Wintering populations of bats in Indiana, with emphasis on the endangered Indiana Myotis, Myotis sodalist 3. Management of hibernacula in the state of Indiana 4. Home range near hibernacula in spring and autumn 5. Brack, Johnson and Dunlap, 2003. 1. Pearson, W. D. and C. Boston	5	100%

	2. Virgil Brack, Jr., Scott A. Johnson, and R. Keith Dunlap		
	3. Johnson, Brack, Dunlap		
	4. Russell C. Romme, Amy B. Henry, R. Andrew King, T. Glueck, and K. Tyrell		
Date	1. 1995 2. 2003 3. 2002 4. 2002	**4**	**80%**
Publisher	1. Final report to IN Department of Nat. Res.Div. of F&W 2. Proceedings of the IN Academy of Science 3. Bat Conservation International 4. The Indiana Bat: Biology and Management of an Endangered Species. Bat Conservation International 5. Proc. Ind. Acad, Sci. 112:-61-74.	**5**	**100%**
		Total Respondents	**5**

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

		Response Total	Response Percent
Title	1. Age, growth and fin erosion of the northern cavefish, Amblyopsis spelaea, in KY and IN 2. Biennial hibernacula survey reports 3. The nonhibernating ecology of bats in Indiana with emphasis on the endangered Indiana bat, Myotis sodalist 4. Mumford and Whitaker 1982	**4**	**100%**
Author	1. Louis, M. 2. Virgil Brack, Jr.	**2**	**50%**
Date	1. 1999 2. 1983	**2**	**50%**
Publisher	1. Unpubl. M.S. Thesis, University of Louisville 2. reports submitted to IDNR 3. Purdue University	**3**	**75%**
		Total Respondents	**4**

36. What is the current HABITAT body of science for the Wildlife in All subterranean systems Habitat in Indiana?

		Response Total	Response Percent
Complete, up to date and extensive		0	0%
Adequate		1	14%
Inadequate		5	71%
Nonexistent		0	0%
Other (please explain below)	Somewhere between Adequate and Inadequate	1	14%
	Total Respondents		7

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

		Response Total	Response Percent
Title	1. Cave adaptation in Amblyopsid fishes 2. see previous reference 3. same as Q34 4. Hibernacula of the endangered Indiana bat in Indiana 5. Mumford and Whitaker 1982	5	100%
Author	1. Poulson, T. 2. Brack, Virgil Jr., A.M. Wilkenson, R.E. Mumford	2	40%
Date	1. 1963 2. 1984	2	40%
Publisher	1. Amer. Midl. Nat. 70(2):257-290 2. Proceedings of the Indiana Academy of Science, vol. 93:463-468	2	40%
	Total Respondents		5

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

	Response Total	Response Percent
1. A faunal inventory of subterranean streams using a modified index of biotic integrity		

	2. same as Q35 3. Distribution and ecology in Indiana. Pp 48-54 in Indiana Bat: Biology and Management of an Endangered Species (A. Kurta and J. Kennedy, Eds.) 4. Veilleux et al. 2003.		
Author	1. Jones, T.G. 2. John Whitaker Jr. & Virgil Brack Jr.	**2**	**50%**
Date	1. 1997 2. 2002	**2**	**50%**
Publisher	1. Unpubl. Ph.D. Disst. University of Louisville 2. Bat Conservation International 3. J. Mamm, 841068-1075	**3**	**75%**
		Total Respondents	**4**

39. What are the research needs for the Wildlife in All subterranean systems Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Life cycle	0% (0)	14% (1)	57% (4)	29% (2)	0% (0)	0% (0)	**7**
Distribution and abundance	14% (1)	29% (2)	29% (2)	29% (2)	0% (0)	0% (0)	**7**
Limiting factors (food, shelter, water, breeding sites)	43% (3)	0% (0)	57% (4)	0% (0)	0% (0)	0% (0)	**7**
Threats (predators/competition, contamination)	29% (2)	43% (3)	29% (2)	0% (0)	0% (0)	0% (0)	**7**
Relationship/dependence on specific habitats	29% (2)	29% (2)	29% (2)	14% (1)	0% (0)	0% (0)	**7**
Population health (genetic and physical)	14% (1)	29% (2)	14% (1)	29% (2)	0% (0)	14% (1)	**7**
Other (please specify below)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	25% (1)	**4**
					Total Respondents		**46**

40. Other research needs for the Wildlife in All subterranean systems Habitat in Indiana.

1. We need urgently need to determine the effects of the loss/fragmentation/timber management of summer habitat/forest on maternity colonies/reproductive success not just caves/winter habitat.

2. More information is needed on autumn swarming and spring staging. Similarly new hibernacula need to be recorded.

3. 1. Metapopulation dynamics
2. Extent of populations in subterranean systems which annot be entered by humans

4. need to know more about rabies in some wildlife species

Total Respondents 4

41. What are the HABITAT research needs for the Wildlife in All subterranean systems Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	29% (2)	33% (2)	43% (3)	0% (0)	**7**
Distribution and abundance (fragmentation)	0% (0)	43% (3)	43% (3)	17% (1)	0% (0)	0% (0)	**7**
Threats (land use change/competition, contamination/global warming)	43% (3)	29% (2)	29% (2)	0% (0)	0% (0)	0% (0)	**7**
Relationship/dependence on specific site conditions	14% (1)	71% (5)	0% (0)	0% (0)	0% (0)	14% (1)	**7**
Growth and development of individual components of the habitat	0% (0)	33% (2)	33% (2)	0% (0)	17% (1)	17% (1)	**6**
Other (please specify below)	25% (1)	50% (2)	0% (0)	0% (0)	0% (0)	25% (1)	**4**
					Total Respondents		**38**

42. Other HABITAT research needs for the Wildlife in All subterranean systems Habitat in Indiana.

1. How much forest habitat needs to remain arround a hibernaculum to sustain a population of size x during the fall swarming period?

2. -How does cave environment, especially temperature and temperature stability, affect suitability and use of cave by Indiana bats
-What components of the habitat immediately surrounding the cave are most important to Indiana bats during fall swarming and spring staging. How is this habitat used.

3. Recommend a detailed analysis of forest canopy to openness ratio and habitat intricacies that provide preferred home range requirements, e.g. primary roosts, secondary roosts, water, night roosts, food.

4. 1. Assessment of the physical dimensions of the phreatic environment available to cavefishes, and the connections between known windows into the system.
2. Toxin concentrations in cave sediments and their recruitment rates into undergroud waters.

5. need to know more of the relationship between winter and summer habitat, and also of migration.

Total Respondents 5

43. How well do the following conservation efforts address the threats to the Wildlife in All subterranean systems Habitat in Indiana?

Appendix E-60: Aggregated Subterranean Systems

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection (use below for details)	50% (3)	50% (3)	0% (0)	0% (0)	0% (0)	**6**
Population management (hunting, trapping)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Population enhancement (captive breeding and release)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Reintroduction (restoration)	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Food plots	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Threats reduction	33% (2)	50% (3)	0% (0)	17% (1)	0% (0)	**6**
Native predator control	0% (0)	0% (0)	0% (0)	83% (5)	17% (1)	**6**
Exotic/invasive species control	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
Regulation of collecting	50% (3)	33% (2)	0% (0)	17% (1)	0% (0)	**6**
Disease/parasite management	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Translocation to new geographic range	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Protection of migration routes	0% (0)	0% (0)	0% (0)	67% (4)	33% (2)	**6**
Limiting contact with pollutants/contaminants	0% (0)	33% (2)	0% (0)	33% (2)	33% (2)	**6**
Public education to reduce human disturbance	33% (2)	67% (4)	0% (0)	0% (0)	0% (0)	**6**
Culling/selective removal	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Stocking	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
				Total Respondents		**80**

44. Other current conservation practices for the Wildlife in All subterranean systems Habitat in Indiana.

1. posting signs at caves, installing-bat friendly gates, land acquisition, installing fake video cameras to deter cave visits,using light-sensitve "speloggers" to monitor levels of human visitation

2. Note, I included regulation of research and research related disturbance under "regulation of collecting"

3. Protect ome caves and mines in which some wildlife species occurs.

Total Respondents **3**

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

1. Negotiate with the owner of Ray's Cave and other hibernacula to allow them to be gated or employ one or more of the other techniques above.

2. -Gating, securing conservation easements, or purchasing unprotected hibernacula (prioritizing based on current numbers or potential of hibernacula to harbor large numbers if disturbance is presently limiting numbers).
-Protecting surface features and forest cover surrounding hibernacula and manageing for high quality swarming habitat.

3. The purchasing and protection of recorded Indiana bat hibernacula and summer habitat. Similarly, public education is

needed on the importance of caves, snags, and the importance of this species to man.

4. 1. Acqusition and protection of a reserve at Blue Spring Caverns
2. Limit public access to population concentrations already under agency control at Harrison/Crawford State Forest and Spring Mill State Park

5. protect caves a and mines
continued education of people about bats.

6. Protect cave entrances from inappropriate management activities.

Total Respondents **6**

46. How well do the following conservation efforts address the HABITAT threats to the Wildlife in All subterranean systems Habitat in Indiana?

	Very well	Somewhat	Not at all	Not used	Unknown	Response Total
Habitat protection through regulation	17% (1)	83% (5)	0% (0)	0% (0)	0% (0)	**6**
Habitat protection on public lands	33% (2)	67% (4)	0% (0)	0% (0)	0% (0)	**6**
Habitat protection incentives (financial)	0% (0)	33% (2)	0% (0)	50% (3)	17% (1)	**6**
Habitat restoration through regulation	0% (0)	33% (2)	0% (0)	50% (3)	17% (1)	**6**
Habitat restoration on public lands	0% (0)	83% (5)	0% (0)	17% (1)	0% (0)	**6**
Habitat restoration incentives (financial)	0% (0)	33% (2)	0% (0)	50% (3)	17% (1)	**6**
Artificial habitat creation (artificial reefs, nesting platforms)	0% (0)	17% (1)	0% (0)	83% (5)	0% (0)	**6**
Selective use of functionally equivalent exotic species in place of extirpated natives	0% (0)	0% (0)	0% (0)	100% (6)	0% (0)	**6**
Succession control (fire, mowing)	0% (0)	0% (0)	17% (1)	83% (5)	0% (0)	**6**
Corridor development/protection	0% (0)	33% (2)	0% (0)	50% (3)	17% (1)	**6**
Managing water regimes	0% (0)	17% (1)	0% (0)	67% (4)	17% (1)	**6**
Pollution reduction	0% (0)	50% (3)	0% (0)	33% (2)	17% (1)	**6**
Protection of adjacent buffer zone	33% (2)	17% (1)	0% (0)	33% (2)	17% (1)	**6**
Restrict public access and disturbance	50% (3)	50% (3)	0% (0)	0% (0)	0% (0)	**6**
Land use planning	33% (2)	50% (3)	0% (0)	17% (1)	0% (0)	**6**
Technical assistance	50% (3)	0% (0)	0% (0)	33% (2)	17% (1)	**6**
Cooperative land management agreements (conservation easements)	50% (3)	33% (2)	0% (0)	17% (1)	0% (0)	**6**
Other (please specify below)	33% (1)	33% (1)	0% (0)	0% (0)	33% (1)	**3**
				Total Respondents		**105**

47. Other current HABITAT conservation practices for the Wildlife in All subterranean systems Habitat in Indiana.

1. Generally educate the public on retaining old, dead or dying trees that provide habitat for wildlife, including the Indiana bat.

2. 1. Closing and/or year around gating of caves with large populations of hibernating or reproducing bats will ensure normal trophic cascades for those systems.
2. Restricting recreational caving in some caves might reduce periodic disturbances, increases in turbidity, and remobilization of toxins in sediments.

Total Respondents **2**

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

1. Conservation easements on private property containing important swarming habitat and connected karst features around key hibernacula.

2. same as Q45

3. See #45.

4. 1. Establishment of reserve at Blue pring Cavern
2. Restricted entry to selected caves in the Harrison/Crawford State Forest
3. Obtaining conservation easements/agreements with selected cave owners in Orange, Washington, Lawrence, and Harrison Counties.

5. Protect cave entrances from disturbance.

Total Respondents **5**

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

1. I am consulting with FHWA and INDOT on their proposed I-69 extention which is traversing karst terrain in Monroe and Greene counties. INDOT consultants are surveying many previously unsurveyed caves (n = 60 in 2004-05) that are potential Indiana bat hibernacula. New data will be available by March 2005.

The FWS is also currently revising the Indiana Bat Recovery Plan, which once completed will be an excellent source of information for this effort. Lori Pruitt is the best contact to keep up with the plan's status.

2. Maintain bat friendly human barriers at hibernacula
Research needs:
1) determine adequate levels of snag retention in managed forests
2) Include snag retention and snag decay rate in models of forest composition
3) estimate reproductive success or survival

3. Work closely with all appropriate federal and state environmental agencies in coordinating efforts on the Indiana bat.

4. A map of all known sightings of cavefishes, and dye-traced and probable connections between these known locations should be produced. Such a compilation would be invaluable in assessing the potential impacts of proposed projects, spills, and other landscape events within the limited range of the northern cavefish in Indiana

Total Respondents **4**

Appendix E-61: Subterranean Systems

Technical experts did not provide input on a representative species for this habitat.

There are no species of greatest conservation need in this guild.

6. Please rank the following threats to the Wildlife in Cave Entrances Habitat in Indiana.

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

7. Please also rank these threats to the Wildlife in Cave Entrances Habitat in Indiana.

	Critical threat	Serious threat	Somewhat of a threat	Slight threat	No threat	Unknown	Response Total
Habitat loss (breeding range)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Habitat loss (feeding/foraging areas)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Small native range (high endemism)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	**1**
Near limits of natural geographic range	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Large home range requirements	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	0% (0)	**1**
Viable reproductive population size or availability	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Specialized reproductive behavior or low reproductive rates	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Degradation of movement/migration routes	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**

(overwintering habitats, nesting and staging sites)							
Genetic pollution (hybridization)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**10**

8. Other threats to the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

Oxidus gracilis is a non-native carnivorous millipede invading caves in the east; it is now in several Indiana caves and is preying on the food base for cave salamanders. Further east, reports of greatly decreased insect diversity in caves invaded by this millipide have been reported. Potential impact is unknown, but could be significant.

Total Respondents **1**

10. Please rank the following threats to the HABITAT of the Wildlife in Cave Entrances Habitat in Indiana.

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

(persistent toxins)							
Point source pollution (continuing)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Mining/acidification	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Drainage practices (stormwater runoff)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Unknown	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	**0**
					Total Respondents		**17**

11. Other HABITAT threats to the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

Forestry practices that open the forest canopy around cave entrances can greatly impact the habitat for this species, drying out the entrance to the point it is not useable habitat by the salamanders.

Total Respondents **1**

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

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

agencies	
Total Respondents	**8**

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

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

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

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

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

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

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

17. Regional or local state agency monitoring for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

18. Regional or local monitoring by other organizations for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

19. Please list organizations that are monitoring the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

20. What are the current monitoring techniques for the Wildlife in Cave Entrances Habitat in Indiana?

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

Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**13**

21. Other monitoring techniques for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

No responses were entered for this question.

Total Respondents **0**

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

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

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

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

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

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

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

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

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

conducted by other organizations

Total Respondents 7

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

DFW - nongame

Total Respondents 1

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

Indiana Karst Conservancy and local grottos

Total Respondents 1

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

Indiana Karst Conservancy and local grottos

Total Respondents 1

30. What are the current HABITAT inventory and/or assessment techniques for the Wildlife in Cave Entrances Habitat in Indiana?

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

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

Modeling	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Voluntary landowner reporting	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**10**

31. Other HABITAT inventory and assessment techniques for the Wildlife in Cave Entrances Habitat in Indiana.

Visual estimation - has the entrance been changed in anyway from its historical configuration (forest canopy opened up, entrance enlarged or blocked, etc.)

Total Respondents **1**

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

No responses were entered for this question.

Total Respondents **0**

33. What is the current body of science for the Wildlife in Cave Entrances Habitat in Indiana?

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

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

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

Publisher	0	0 %
	Total Respondents	0

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

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

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

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

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

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

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

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

39. What are the research needs for the Wildlife in Cave Entrances Habitat in Indiana?

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

40. Other research needs for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

41. What are the HABITAT research needs for the Wildlife in Cave Entrances Habitat in Indiana?

	Urgently needed	Greatly needed	Needed	Slightly needed	Not needed	Unknown	Response Total
Successional changes	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Distribution and abundance (fragmentation)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**

Threats (land use change/competition, contamination/global warming)	0% (0)	0% (0)	100% (1)	0% (0)	0% (0)	0% (0)	**1**
Relationship/dependence on specific site conditions	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Growth and development of individual components of the habitat	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents		**1**

42. Other HABITAT research needs for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

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

Other (please specify below)	0% (0)	0% (0)	0% (0)	0% (0)	100% (1)	**1**
					Total Respondents	**1**

44. Other current conservation practices for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

Protect cave entrances from inappropriate management activities.

Total Respondents **1**

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

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

Total Respondents **18**

47. Other current HABITAT conservation practices for the Wildlife in Cave Entrances Habitat in Indiana.

No responses were entered for this question.

Total Respondents **0**

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

Protect cave entrances from disturbance.

Total Respondents **1**

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

No responses were entered for this question.

Total Respondents **0**