

Appendix E-48: Aggregated Grasslands

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							

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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							

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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 is 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

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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 in isolated situations do grasslands develop as a dominant 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 land use change and inappropriate management – eg – fire suppression). Most known populations seem to occur at such low densities that mating seems a remote possibility. 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.

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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						

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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

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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, ditches etc. or introduction of fish into breeding waters.
- Loss of grasslands, and grassland ground squirrel populations.
- Fragmentation of habitat.
- Successional change results in habitat degradation 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 activities 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 or 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 through 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

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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 occurring	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 occurring	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

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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						

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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 Division 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

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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 occurring 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, and 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

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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							

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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

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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 warranted (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 and can be combined with other surveys.
 - McWheter, Gary Randolph, 1991, Estimating Abundance 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 species or species group in early successional habitats and then correlated 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 specifically 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 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

14

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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	

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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		

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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							

Appendix E-48: Aggregated Grasslands

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 occasional 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

Appendix E-48: Aggregated Grasslands

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
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Appendix E-48: Aggregated Grasslands

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							

Appendix E-48: Aggregated Grasslands

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-farmland lands.
- Grassland mapping 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

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.

Appendix E-48: Aggregated Grasslands

- 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 brevicauda

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

Appendix E-48: Aggregated Grasslands

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

Appendix E-48: Aggregated Grasslands

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							

Appendix E-48: Aggregated Grasslands

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

Appendix E-48: Aggregated Grasslands

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, with 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

Appendix E-48: Aggregated Grasslands

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

Appendix E-48: Aggregated Grasslands

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, because 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 EAsern Cottontail Rabbit Populations to Prescribed Burning, Cover Enhancement and Food Plots. Alabama Game & Fish Divison/Auburn University.
- Maintenance of early sucesional 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

Appendix E-48: Aggregated Grasslands

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