

SHRUB/SCRUB HABITATS NARRATIVE

Habitat description

Shrubland includes areas characterized by natural or semi-natural woody vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions are included.

Shrubs dominate this habitat; shrub canopy accounts for 25 to 100 percent of the cover. Shrub cover is generally greater than 25 percent when tree cover is less than 25 percent. Shrub cover may be less than 25 percent in cases when the cover of other life forms (e.g. herbaceous or tree) is less than 25 percent and shrubs cover exceeds the cover of the other life forms.

Problems affecting species and habitats

Species threats

Respondents ranked threats to wildlife in shrub/scrub habitats in Indiana:

Rank	Threats to wildlife in shrub/scrub habitats
1 (tie)	Habitat loss (breeding range)
1 (tie)	Habitat loss (feeding/foraging areas)
2 (tie)	Predators (native or domesticated)
2 (tie)	Viable reproductive population size or availability
2 (tie)	Invasive/non-native species
3 (tie)	Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)
3 (tie)	Near limits of natural geographic range
3 (tie)	Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)
3 (tie)	Regulated hunting/fishing pressure (too much)
4 (tie)	Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)
5 (tie)	Diseases/parasites (of the species itself)

Respondents listed an additional threat to wildlife in shrub/scrub habitats in Indiana:

- Natural succession in remaining shrub/scrub habitats

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Respondents described top threats to wildlife in shrub/scrub habitats in Indiana (not ranked):

- Habitat loss
 - Development and farming destroys brooding and foraging areas and escape cover
 - Clean farming practices
- Lack of management to maintain/create these types of habitats
- Isolation of habitat or islands of habitat with no connecting travel lands
- Predators (especially domesticated animals)

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

- Habitat is important for nesting wood ducks. Also used by migrating waterfowl.

Habitat threats

Respondents ranked threats to shrub/scrub habitats in Indiana:

Rank	Threats to shrub/scrub habitats
1	Commercial or residential development (sprawl)
2	Successional change
3 (tie)	Habitat fragmentation
3 (tie)	Habitat degradation
3 (tie)	Agricultural/forestry practices
4	Climate change
5 (tie)	Invasive/non-native species
5 (tie)	Residual contamination (persistent toxins)
6 (tie)	Point source pollution (continuing)
6 (tie)	Counterproductive financial incentives or regulations
6 (tie)	Nonpoint source pollution (sedimentation and nutrients)
7 (tie)	Impoundment of water/flow regulation
7 (tie)	Diseases (of plants that create habit)
7 (tie)	Mining/acidification
7 (tie)	Drainage practices (stormwater runoff)
8	Stream channelization

Respondents listed no other threats to shrub/scrub habitats in Indiana.

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Respondents listed top threats to shrub/scrub habitats in Indiana (not ranked):

- Successional change
 - Due to lack of management/disturbance of vegetation
- Habitat fragmentation and destruction
 - Agricultural/forestry practices
 - Cause loss of escape cover (including treeline, fence line and wood's edge)
 - Commercial and residential development
 - Limits seasonal movements and population expansion

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

Additional research and survey efforts

Current body of research

Species research

Twenty-five percent of respondents said that current body of science for wildlife in shrub/scrub habitats in Indiana is adequate. Fifty percent said that it was inadequate. One respondent noted that "most research is not specific to Indiana".

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

Title = Bobwhite Quail Investigation;
Author = Maurice C. Reeves;
Date = 1954;
Publisher = Indiana Department of Conservation

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 = 2003 Breeding Population Index of Northern Bobwhite Quail;
Author = James C. Pitman;
Date = July 16, 2004;
Publisher = IDNR F&W

Title = Population Ecology of the Bobwhite;
Author = John L Roseberry;
Date = 1984;
Publisher = SIU Press

Title = Unknown/Quail Investigations;
Author = Maurice Reeves;
Date = Unknown/Old;
Publisher = IDNR/Division of Fish & Wildlife

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

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- Breeding Bird Atlas of Indiana

Habitat research

Twenty-five percent of respondents said that current body of science for shrub/scrub habitats in Indiana is adequate. Seventy-five percent said that it was inadequate or non-existent.

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

Title = Some Aspects of the Relationship between Land and Utilization and Bobwhite Quail;
Author = John L. Roseberry;
Date = 1960;
Publisher = SIU Press

Title = The Bobwhite Quail - Its Life and Management;
Author = Walter Rosene;
Date = 1969;
Publisher = Rutgers University Press

Title = see previous section entry

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the current body science for shrub/scrub habitat. There were no responses.

Research needs

Species research

Respondents ranked research needs for wildlife in shrub/scrub habitats in Indiana:

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

A respondent listed additional research needs for wildlife in shrub/scrub habitats in Indiana:

- Dispersal and repopulation methods of isolated habitats

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

- Other species use of this habitat type.

Wood duck, Mallard, Hooded Merganser, Canada Goose

Habitat research

Respondents ranked research needs for shrub/scrub habitats in Indiana:

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

A respondent listed other research needs for shrub/scrub habitats in Indiana:

- Location and distribution of shrub/scrub habitat

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

Conservation actions necessary

Species actions

Respondents ranked conservation efforts by how well they address threats to wildlife in shrub/scrub habitats in Indiana:

Rank	Conservation efforts for wildlife in shrub/scrub habitats
1 (tie)	Population management (hunting, trapping)
1 (tie)	Food plots
1 (tie)	Public education to reduce human disturbance
2	Habitat protection

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- 3 (tie) Native predator control
- 3 (tie) Exotic/invasive species control
- 3 (tie) Regulation of collecting
- 3 (tie) Limiting contact with pollutants/contaminants

Respondents listed no other conservation practices for wildlife in shrub/scrub habitats in Indiana.

Respondents recommended these practices for more effective conservation of wildlife in shrub/scrub habitats in Indiana (not ranked):

- Habitat protection, development and maintenance
 - Establish more shrub/scrub habitat
 - Control vegetative succession
- Habitat restoration
- Public education: The most important practice that would benefit bobwhites in shrub/scrub habitat is to educate public about what constitutes suitable quail habitat

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

Habitat actions

Respondents ranked conservation efforts by how well they address threats to shrub/scrub habitats in Indiana:

Rank	Conservation efforts for shrub/scrub habitats
1	Selective use of functionally equivalent exotic species in place of extirpated natives
2 (tie)	Habitat protection incentives (financial)
2 (tie)	Habitat restoration on public lands
2 (tie)	Habitat restoration incentives (financial)
2 (tie)	Succession control (fire, mowing)
2 (tie)	Technical assistance
3 (tie)	Land use planning
3 (tie)	Protection of adjacent buffer zone
4 (tie)	Habitat protection on public lands
4 (tie)	Corridor development/protection
4 (tie)	Cooperative land management agreements (conservation easements)
5 (tie)	Habitat protection through regulation

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5 (tie) Restrict public access and disturbance

5 (tie) Habitat restoration through regulation

Respondents listed no other conservation practices for shrub/scrub habitats in Indiana.

Respondents recommended the following for more effective conservation of shrub/scrub habitats in Indiana (not ranked):

- Financial incentives to restore and establish habitat
- Succession control (burning, disking)
- Corridor establishment (Woodland edge feathering, shrub corridor, hedgerow development)
- Technical assistance to maintain habitat

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the conservation practices for shrub/scrub habitat. Their responses included:

- Habitat protection on Private lands

Proposed plans for monitoring

Current monitoring

Species monitoring

Respondents indicated that the following monitoring efforts are conducted by state agencies for wildlife in shrub/scrub habitats in Indiana:

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

Respondents indicated that the following monitoring efforts are conducted by other organizations for wildlife in shrub/scrub habitats in Indiana:

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

Respondents ranked monitoring efforts by state agencies by their importance for wildlife conservation in shrub/scrub habitats in Indiana:

Rank	Monitoring efforts by other organizations for wildlife in shrub/scrub habitats
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- 1 Statewide once-a-year monitoring
- 2 Regional or local once-a-year monitoring
- 3 (tie) Regional or local year-round monitoring
- 3 (tie) Occasional regional or local (less than once a year and not regularly scheduled) monitoring
- 3 (tie) Periodic statewide (less than once a year but still regularly scheduled) monitoring
- 4 Statewide year-round monitoring
- 5 Occasional statewide (less than once a year and not regularly scheduled)

Respondents ranked monitoring efforts by other organizations by their importance for wildlife conservation in shrub/scrub habitats in Indiana:

Rank	Monitoring efforts by other organizations for wildlife in shrub/scrub habitats
1	Regional or local year-round monitoring
2 (tie)	Statewide year-round monitoring
2 (tie)	Statewide once-a-year monitoring

Respondents listed regional or local monitoring by state agencies for wildlife in shrub/scrub habitats in Indiana (not ranked):

- Division of Fish and Wildlife conducts annual spring thistle counts on 77 established routes. The division also conducts biennial surveys of small game license holders to assess bobwhite harvest. Neither of these surveys is focused directly on shrub/scrub habitats
- Division of Fish and Wildlife biologists run routes
- Quail whistling counts in selected counties
- Hunter/harvest surveys by geographic region
- Breeding Bird Survey by survey blocks
- Winamac Fish and Wildlife Area conducts annual bobwhite whistle call surveys on that property

A respondent stated that Quail Unlimited chapters conduct local and regional monitoring for wildlife in shrub/scrub habitats in Indiana.

Respondents listed the following organizations that conduct monitoring for wildlife in shrub/scrub habitats in Indiana (not ranked):

- Quail Unlimited
- National Audubon Society – annual breeding bird survey
- IDNR Division of Fish and Wildlife

Respondents considered current monitoring techniques for wildlife in shrub/scrub habitats in Indiana as follows:

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Monitoring techniques for wildlife in shrub/scrub habitats	Used	Not used but possible with existing technology or data	Not economically feasible
Radio tracking and telemetry	--	X	X
Modeling	X	X	--
Coverboard routes	--	X	--
Spot mapping	--	X	X
Driving a survey route	X	--	--
Reporting from harvest, depredation, or unintentional take (road kill, by-catch)	X	--	--
Mark and recapture	--	X	X
Professional survey/census	X	X	X
Volunteer survey/census	X	X	--
Trapping (by any technique)	--	X	X
Representative sites	--	X	--
Probabilistic sites	--	X	--

Respondents listed no other monitoring techniques for wildlife in shrub/scrub habitats in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for wildlife in shrub/scrub habitat. There were no responses.

Habitat inventory and assessment

Respondents indicated that the following inventory and assessment efforts are conducted by state agencies for shrub/scrub habitats in Indiana (not ranked):

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

Respondents indicated that the following inventory and assessment efforts are conducted by other organizations for shrub/scrub habitats in Indiana (not ranked):

- Statewide annual inventory and assessment
- Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
- Regional or local year-round inventory and assessment

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Respondents ranked inventory and assessment efforts by state agencies for their importance in conserving shrub/scrub habitats in Indiana:

Rank	Inventory and assessment efforts by state agencies for in shrub/scrub habitats
1	Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
2 (tie)	Statewide annual inventory and assessment
2 (tie)	Regional or local year-round inventory and assessment
2 (tie)	Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment
3	Statewide once-a-year inventory and assessment

Respondents ranked inventory and assessment efforts by other organizations for their importance in conserving shrub/scrub habitats in Indiana:

Rank	Inventory and assessment efforts by other organizations for in shrub/scrub habitats
1	Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
2	Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment
3	Statewide year-round inventory and assessment
4	Regional or local year-round inventory and assessment

Respondents provided no regional or local inventory and assessment by state agencies for shrub/scrub habitats in Indiana.

Respondents listed the following regional or local inventory and assessment conducted by other organizations for shrub/scrub habitats in Indiana (not ranked):

- Statewide by regions
- I am 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. I would like to see remotely sensed data used to track statewide and regional changes in acreage over the last 30+ years

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Respondents listed the following organizations that conduct inventory and assessment efforts for shrub/scrub habitats in Indiana (not ranked):

- Quail Unlimited
- USDA
- USDA Forest Service
- North Central Research Station

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Respondents considered current inventory and assessment techniques for shrub/scrub habitats in Indiana as follows:

Inventory and assessment techniques for shrub/scrub habitats	Used	Not used but possible with existing technology or data	Not economically feasible
GIS mapping	X	X	--
Aerial photography and analysis	X	X	--
Systematic sampling	--	X	--
Participation in land use programs	X	--	--
Modeling	--	X	--
Voluntary landowner reporting	--	X	--

Respondents listed no other inventory and assessment techniques for shrub/scrub habitats in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the inventory and assessment techniques for shrub/scrub habitat. Their responses included:

Recommended monitoring

Species monitoring

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

- Radio telemetry study of bobwhites because we lack most baseline data for this species in Indiana. Most information we use to manage quail in Indiana comes from other states
- Whistle counts survey
- Harvest survey
- Survey routes
- Annual hunter/harvest surveys

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for effective conservation of wildlife in shrub/scrub habitat. There were no responses.

Habitat inventory and assessment

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

- I would like to see remotely sensed data used to monitor changes in statewide and regional acreage and distribution. It would be useful to see how trends in shrub/scrub habitat relate to Indiana DFW bobwhite thistle indices

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- Participation in land use programs
- GIS analysis of habitat types

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the inventory and assessment techniques for effective conservation of shrub/scrub habitat. There were no responses.

Technical experts and conservation organizations offered the following additional comments:

- Respondent concerned with Golden-winged Warbler. There are many other species that use this habitat. Waterfowl, songbirds, deer all use shrub/scrub. Need to get more input.