



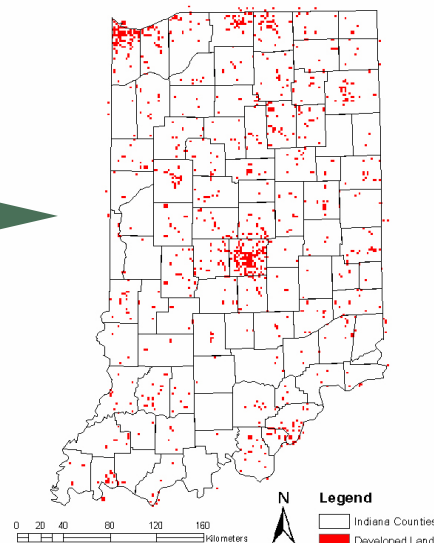
# DEVELOPED LANDS HABITAT SUMMARY



*Developed lands are defined as highly impacted lands, intensively modified to support human habitation, transportation, commerce and recreation. This habitat encompasses the following subhabitat types: golf courses, industrial lands and roads/rails/bridges. Nearly 3.7% of Indiana is developed.*



*Indiana's developed lands constitute 3.69% of Indiana, or 1,404 miles<sup>2</sup> (898,674 acres). While developed lands are sprinkled liberally throughout the state, particularly above Interstate 70, they are concentrated in areas that include Gary, South Bend, Fort Wayne, Indianapolis, Evansville, and Louisville, KY. There are fewer developed lands in south-central Indiana.*



# Indiana's State Wildlife Action Plan

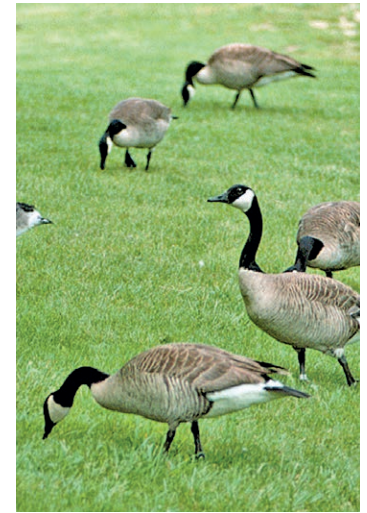
## Representative Species of Developed Lands

The developed lands habitat guild is represented by several species. These representative species “paint a reasonable mental picture” of developed lands.

Bullfrog  
Kirtland's Snake  
American Robin  
European Starling

House Mouse  
Canada Goose  
Eastern Bluebird  
Rock Pigeon

Norway Rat  
Mallard  
Peregrine Falcon  
Cliff Swallow



From left to right: *Bullfrog, American Robin, and Canada Goose.*

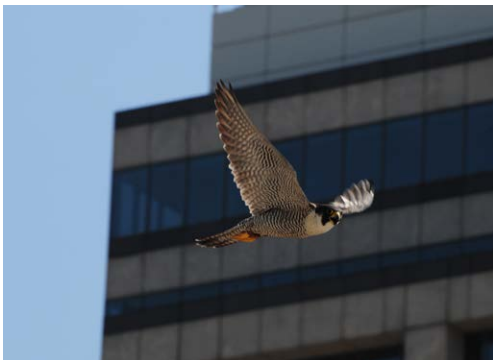
## Species of Greatest Conservation Need (SGCN) in Developed Lands

SGCN are animal species whose populations are rare, declining, or vulnerable.

Eastern Spadefoot  
Kirtland's Snake

Common Nighthawk  
Smooth Greensnake

Peregrine Falcon



From left to right: *Peregrine Falcon, Common Nighthawk (Thomas Barnes, USFWS), and Eastern Spadefoot (Laurel Wilkerson, USFWS)*

## Threats to Developed Lands

- Commercial or residential development (sprawl)
- Habitat degradation
- Impoundment of water/flow regulation
- Drainage practices (stormwater runoff)
- Habitat fragmentation
- Stream channelization
- Residual contamination (persistent toxins)
- Point source pollution (continuing)
- Agricultural/forestry practices
- Counterproductive financial incentives or regulations

## High-Priority Conservation Actions for Developed Lands

### Habitat protection incentives (financial)

- Encourage the use of gravel on flat-roofed buildings to provide nesting habitat for common nighthawks.

### Habitat restoration incentives (financial)

- Encourage the use of private funding sources for the development of open spaces in urban environments.

### Artificial habitat creation (artificial reefs, nesting platforms)

- Erect and maintain nesting boxes for peregrine falcons at industrial areas along Lake Michigan.

### Succession control (fire, mowing)

- Provide cover for smooth greensnakes and Eastern spadefoot toads by leaving unmowed areas during the growing season.

### Land use planning

- Provide technical assistance to and encourage urban/industrial/transportation/recreation land use planners to provide open spaces, use rock cover and provide connecting corridors for the benefit of SGCN, especially spadefoot toads, Kirtland's snake and smooth greensnake.

### Habitat restoration on public lands

- Where possible, develop and implement BMPs for the benefit of SGCN on the more developed portions of public lands and use the implementation sites as demonstration projects.

### Corridor development/protection

- Investigate the parameters defining good dispersal corridors for SGCN in developed lands.

### Habitat protection on public lands

- Develop and implement SGCN habitat-friendly development BMPs on public lands, including public golf courses.

### Cooperative land management agreements (conservation easements)

- Promote the use of cooperative management agreements to provide open spaces, corridors, beneficial landscape features (e.g., natural drainages, rock or stone landscape materials) and native vegetation in developed areas.

## Habitat restoration through regulation

- Promote the use of native vegetation, natural drainage protection, corridor protection and other landscape features to benefit SCGN in developed lands on projects conducted under state permit or receiving public funds.

## Adaptive Management

- Modify survey and monitoring, research and other conservation actions and activities in response to new information to improve habitat conservation efficiency for SGCN.

## Threats to SGCN in Developed Lands

- Degradation of movement/migration routes (overwintering habitats, nesting and staging sites)
- Diseases/parasites (of the species itself)
- High sensitivity to pollution
- Species overpopulation
- Bioaccumulation of contaminants
- Genetic pollution (hybridization)
- Invasive/non-native species
- Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)
- Habitat loss (breeding range)
- Predators (native or domesticated)

## High-Priority Conservation Actions for SGCN in Developed Lands

### Protection of migration routes

- Investigate methods to minimize the adverse impacts of man-made structures on SGCN, especially migrating birds.

### Regulation of collecting

- Develop technical assistance materials that promote leaving SGCN in the natural environment.

### Population management

- Investigate the impacts of unexploited or lightly exploited game species, often found in developed areas (e.g., deer, raccoon, beaver), on SGCN.

### Food plots

- Develop and provide technical assistance to property managers, groundskeepers, park managers and landscape technicians regarding the use of native plants and landscape features that attract food for SGCN.

## Habitat protection

- The reptiles and amphibians that can be found in this habitat type can be conserved through habitat protection. Kirtland's snakes and smooth greensnakes can be found in urban environments. However, these species require some undisturbed habitat in order to thrive. By creating protected islands of habitat in those areas where these species occur, you could conserve them in an urban situation. Examples would include creating parks that overlap moist areas and providing protective cover.
- Minimizing disturbance on areas of sandy soil can protect the Eastern spadefoot. By minimizing soil disturbance, this burrowing species can remain in semi-developed areas.

## Public education to reduce human disturbance

- Make site managers aware of peregrine falcon nesting needs and breeding timelines. Discourage human use of building roofs used by nesting common nighthawks.  
Limiting contact with pollutants/contaminants
- Reduce contaminant loads in birds fed upon by resident and migratory peregrine falcons along Lake Michigan. Encourage avian control operators to utilize methods that will minimize secondary poisoning threats to peregrine falcons and other raptors.

## Population enhancement (captive breeding and release)

- Investigate the possibility of using captive breeding and releases to augment populations of SGCN in developed lands.

## Reintroduction (restoration)

- Continue to support the peregrine falcon restoration by providing technical assistance to facility managers that allow the placement of nest boxes on their properties.

## Threats reduction

- Investigate threats to SGCN in developed lands.
- Support the retention of vernal pools and some unmowed tallgrass areas in developed areas to the benefit of Eastern spadefoot toads and smooth greensnakes.
- Encourage minimal use of pest-control and lawn chemicals in developed lands, especially those near water to benefit Eastern spadefoot toads, Kirtland's snake and the smooth greensnake.

## Adaptive Management

- Modify survey and monitoring, research and other conservation actions and activities in response to new information to improve conservation efficiency for SGCN.

