

APPENDIX F

WILDLIFE STRIKES

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APPENDIX F WILDLIFE STRIKES

Appendix F presents the methodology used to analyze the potential for wildlife to be hit by operating trains (that is, wildlife strikes) under the Proposed Transaction, summarizes the available information on the risk of wildlife strikes, and compares land cover among the rail lines to evaluate changes in the risk of wildlife strikes resulting from the shifts in train traffic proposed by CSX Transportation, Inc. (CSXT).

F.1 PROJECT BACKGROUND

Under the Proposed Transaction, CSXT proposes to shift train traffic among seven rail lines in the project area in Indiana, Ohio, and Kentucky. These rail lines are shown in Figure F.1-1, below. The proposed changes in traffic levels and the maximum speeds at which trains would travel on each rail line are shown in Table F.1-1. Train traffic would increase along the Louisville & Indiana Railroad Company rail line (L&I Line), Indianapolis Line Subdivision, Indianapolis Terminal Subdivision – Louisville Secondary Branch, and Louisville Connection, while train traffic would decrease along the Toledo Subdivision, Cincinnati Terminal Subdivision, and LCL Subdivision.¹ Train speeds would increase on the L&I Line, but no other changes in speeds are proposed.

¹ The Toledo Subdivision and the Cincinnati Terminal Subdivision are considered together relative to wildlife strikes because these rail lines have the same existing and proposed train traffic and speeds.

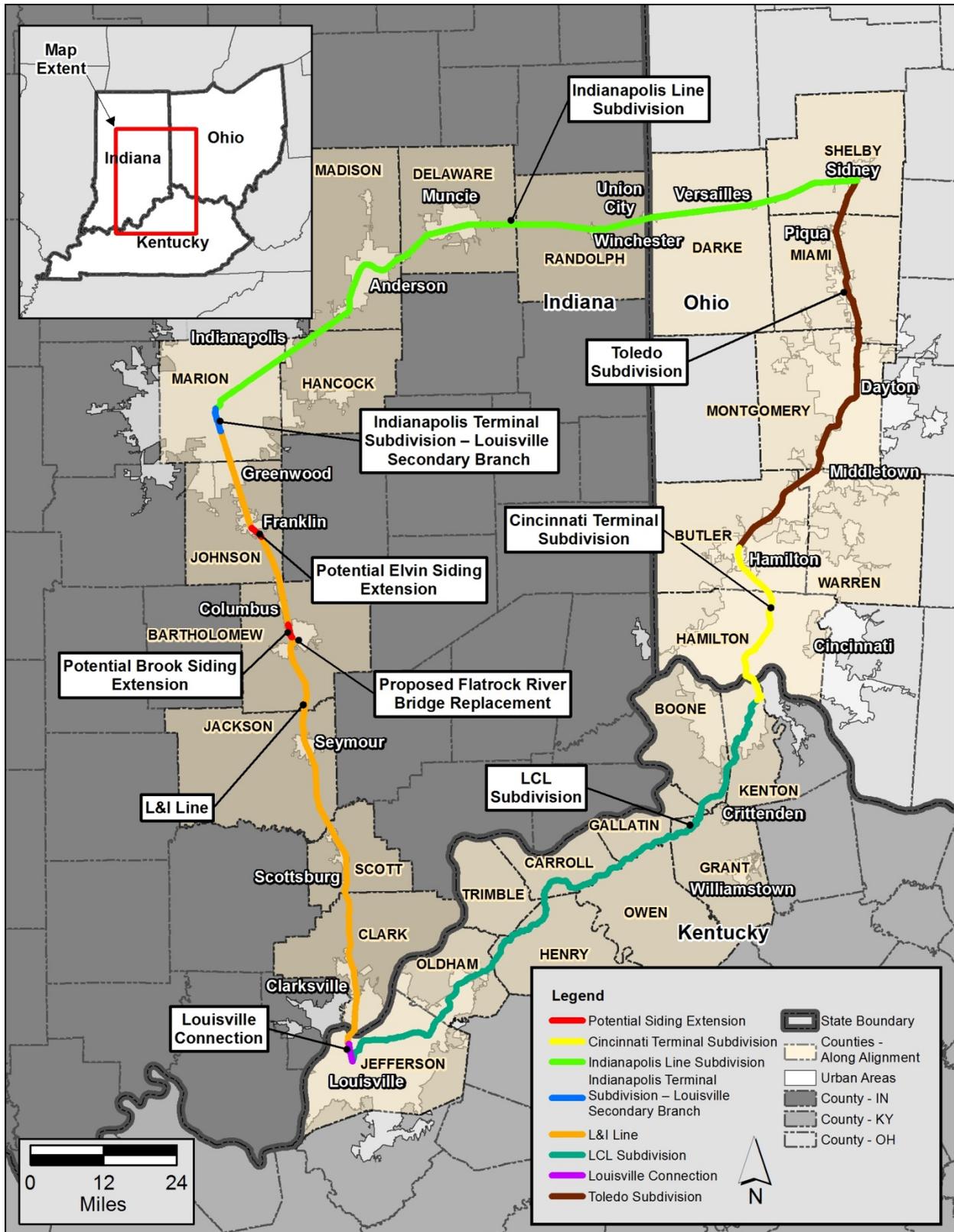


Figure F.1-1. Project Location

Table F.1-1. Proposed Changes in Train Traffic and Speed

Rail Line	Proposed Changes					
	Traffic (Trains/Day)			Maximum Change in Speed (mph)		
	2011	2014	Change	2011	2014	Change
L&I Line ^a						
• LIRC-01 (Marion to Bartholomew County, Indiana)	2	17	+15	25 ^c	49 ^c	+24
• LIRC-02 (Scott to Clark County, Indiana)	4	17	+13	25	49	+24
• LIRC-03 (Clark County, Indiana, to Jefferson County Kentucky)	7	20	+13	6 ^c	20 ^c	+14
Indianapolis Line Subdivision	23	34	+11	55 ^c	55 ^c	0
Indianapolis Terminal Subdivision – Louisville Secondary Branch	4	17	+13	10	10	0
Louisville Connection	6	18	+12	10	10	0
Toledo Subdivision/Cincinnati Terminal Subdivision	28 to 31	17 to 20	-11	50 ^c	50 ^c	0
LCL Subdivision ^b	17	8	-9	15 ^c	15 ^c	0

Source: CSXT, 2014, Average Trains per Day in 2013. Excel spreadsheet received via email on May 12, 2014, from Louis E. Gitomer on behalf of CSXT.

Notes:

^a The L&I Line is divided into three segments. LIRC is the Louisville and Indiana Railroad Company.

^b The LCL Subdivision is CSXT's Louisville to Cincinnati corridor.

^c There are multiple maximum speeds along these rail lines, ranging from 6 to 55 mph. The maximum change in speed for the entire rail line is shown here.

The Proposed Transaction was evaluated in a Draft Environmental Assessment (EA) that was issued for public review and comment in August 2013. The U.S. Environmental Protection Agency (USEPA) submitted its comments on October 31, 2013, in a letter from Mr. Kenneth Westlake, Chief of the National Environmental Policy Act (NEPA) Implementation Section, to Ms. Victoria Rutson, Director of the Office of Environmental Analysis (OEA) at the Surface Transportation Board (STB). USEPA expressed concern about the wildlife strike analysis conducted for the Draft EA, stating the following:

In discussion of project impacts to wildlife and habitats, the Draft EA states on Page 3-44, "The proposed increase in train traffic on the Line [sic the LIRC] could result in an increase in wildlife strikes. However, as noted previously, the proposed increase in train traffic on the Line would result from CSXT diverting existing train traffic from its connecting rail lines. Therefore, any increase in animal strikes on the Line could be offset by fewer animal strikes on CSXT's

connecting rail lines.” This conclusion is not supported by any analysis. Without further analysis available in the Draft EA than Figure 3.6-1, we conclude two impact outcomes. First, more trains at higher speeds are likely to produce more strikes to all species. Second, there is far more “priority Habitat” illustrated in Figure 3.6-1 in relation to the proposed LIRC Line than along the Ohio River CSXT Line; therefore greater impacts to threatened and endangered species, state priority species, and migratory birds are expected. While animal strike numbers have not been recorded and could be very difficult to obtain, we recommend that some method of estimating these impacts be devised, and mitigation measures be developed in concert with [the U.S. Fish and Wildlife Service] USFWS and/or [the Indiana Department of Natural Resources] INDNR. (USEPA 2013)

To address USEPA’s comment, potential wildlife strikes resulting from train traffic changes along the majority of the rail lines in the project area are analyzed in the Supplemental EA. Potential wildlife strikes are not analyzed along the Indianapolis Terminal Subdivision – Louisville Secondary Branch and the Louisville Connection because these rail lines are located in urban areas and do not have adequate habitat for wildlife, including threatened and endangered species.

F.2 METHODOLOGY FOR WILDLIFE STRIKE ANALYSIS

For the analysis of wildlife strikes, the affected environment was described by presenting updated lists of federally and state-protected species and other biological resources that could be affected by changes in operations on the rail lines in the project area (with the exception of the Indianapolis Terminal Subdivision – Louisville Secondary Branch and the Louisville Connection, as discussed in Section F.1). Federally and state-protected species are discussed briefly below in Section F.4.1; detailed descriptions of some species are provided in the Supplemental EA, Appendix E, Threatened and Endangered Species.

The environmental impacts of wildlife strikes on protected species and other biological resources were determined by analyzing the relative rate of increases in train traffic and speed on the L&I Line and Indianapolis Line Subdivision. In addition, decreases in traffic on the Toledo Subdivision/Cincinnati Terminal Subdivision and LCL Subdivision were discussed.

To evaluate potential effects of wildlife strikes, the following tasks were completed:

- Review research or information on wildlife mortalities cause by trains, and applicable information on highway mortalities.
- Identify vulnerable species and their habitat.
 - Determine which species are vulnerable to mortalities caused by trains and thus could be impacted by a change in traffic and/or speed on the rail lines.
 - For the species that are considered vulnerable to such impacts, determine habitat needs.
- Quantify potential habitat along the rail lines.
 - Locate a map of land cover or vegetation communities for analysis in geographic information systems (GIS) along the L&I Line, Indianapolis Line Subdivision, Toledo Subdivision/Cincinnati Terminal Subdivision and LCL Subdivision.

- Select a study area to analyze. The study area included the rail lines and a 0.5-mile-wide buffer on either side of the rail line.
- Assess priority habitat and compare the amount of habitat available along the L&I Line and Indianapolis Line Subdivision to that found along the Toledo Subdivision/Cincinnati Terminal Subdivision and LCL Subdivision.
- Qualitatively discuss potential effects on protected species and wildlife. (This discussion was qualitative because information was not available that could be used to definitively determine whether an increase in traffic would lead to an increase in mortality or other effects.)

F.3 RISK OF WILDLIFE STRIKES BY TRAINS

CSXT and other rail companies are not required to monitor wildlife strikes. STB does not collect wildlife strike data, and a review of the Federal Railroad Administration's (FRA's) website (fra.dot.gov) indicates that FRA also does not systematically collect information on how frequently wildlife is harmed by trains. If wildlife strikes occurred commonly, it is likely that these events would be documented and reported, and that monitoring would have been required for at least some rail operations. The lack of reports or other information indicates that the incidence of operating trains striking or otherwise harming wildlife probably is low; however, this cannot be stated with certainty.

The Federal Highway Administration (FHWA) and many state transportation departments have substantial information on wildlife strikes by vehicles on highways and on methods that can be used to minimize those impacts, such as wildlife crossings (FHWA 2000, 2008, and 2011). However, that information has limited applicability to this analysis because train operations involve relatively infrequent passing of large, connected groups of rail cars, whereas highway operations involve more frequent presence of individual vehicles.

A limited number of articles and reports describe injuries and deaths of wildlife caused by trains. Collisions between trains and large game species such as moose in Colorado (Shell 2014) and Alaska (Rausch 1956) and bighorn sheep in New Mexico (New Mexico Department of Game and Fish 2005) have been documented. Moose use rail lines following snowfall because they provide a plowed trail that connects areas of winter moose browse,² principally willow, aspen, and birch (Rausch 1956).

Collisions between trains and eagles have been documented in Germany (Krone et al. 2003) and in the eastern United States. In all instances, these are the results of high-speed trains passing through important or sensitive habitats, such as nesting areas. In most cases, eagles may have been scavenging on carcasses of deer or other wildlife killed on the rail line and were unable to evade oncoming trains. Near the New River Gorge National River in West Virginia, both a male and a female of a bald eagle pair were struck by an Amtrak train a year apart from one another. Both survived the strike. It was suggested that spillage from grain-bearing hopper cars lured deer to the tracks that were then hit by trains and that the eagles were then attracted to the deer carcasses (Steelhammer 2014). A study in New York State found that most eagle strikes

² The term "moose browse" refers to moose feeding or grazing on leaves and twigs of woody vegetation, particularly species of willow, cottonwood, birch, cherry, and alder.

occurred during the fall migration or overwintering and that young eagles are more likely to be struck because of their reliance on scavenging (Stone, Nye, and Okoniewski 2001).

None of the articles or reports note the speed at which the trains were traveling. Ideally, a comparison of speed to strikes would help determine whether increased train speeds would lead to an increase in wildlife strikes. Therefore, it is impossible to directly analyze the risk of wildlife strikes from the proposed 10 to 24 mph increase in speeds along the L&I Line.

F.4 SENSITIVE AND VULNERABLE SPECIES

Sensitive and vulnerable species that occur along the rail lines in the study area (defined in Section F.5) were identified. For purposes of this wildlife strike analysis, sensitive and vulnerable species are defined as those with potential to be impacted by the Proposed Transaction and that have some level of federal protection or are important to the state. They include species provided protection under the Endangered Species Act, birds of conservation concern, state priority species, and game species.

F.4.1 Threatened and Endangered Species

The effects of increased train traffic on threatened and endangered species are addressed in the Supplemental EA, Appendix E. In that analysis, four federally listed or proposed terrestrial animal species—the least tern (*Sterna antillarum*), gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and northern long-eared bat (*Myotis septentrionalis*)—were identified as occurring (that is, the gray bat occurs near the L&I Line) or potentially occurring along or near the L&I Line, the Indianapolis Line Subdivision, or both (that is, the rail lines on which train traffic would increase) and could be affected by train operations. In addition, state-protected species, including many bird species, ten reptile species, and one mammal, the evening bat (*Nycticeilus humeralis*), were identified as potentially occurring within the 13 counties crossed by the L&I Line and the Indianapolis Line Subdivision and could be affected by train operations.

On the Toledo Subdivision/Cincinnati Terminal Subdivision and the LCL Subdivision, (that is, the rail lines on which train traffic would decrease), additional federally listed or candidate species include the purple cat's paw (a mussel) (*Epioblasma obliquata obliquata*), Braun's rock cress (*Arabis perstellata*), and eastern massasauga (*Sistrurus catenatus*) (USFWS 2014). The eastern massasauga is the only additional species that would be subject to being struck by a train.

F.4.2 Migratory Birds and Birds of Conservation Concern

The Migratory Bird Treaty Act of 1918 (MBTA) protects migratory birds from “hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any...bird, or any part, nest, or egg” (16 United States Code [U.S.C.] § 704). USFWS maintains a list of birds protected under MBTA (USFWS 2013).

The 1988 amendment to the Fish and Wildlife Conservation Act mandates USFWS to “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act” (16 U.S.C. § 2912). USFWS has divided the United States into Bird Conservation Regions (BCRs) and identified priority species within each BCR (USFWS 2008). The rail lines in the project area are within the Central Hardwoods and the Eastern Tallgrass Prairie BCRs, as shown

in Figure F.4-1. USFWS lists 26 birds in the Central Hardwoods BCR and 39 birds in the Eastern Tallgrass Prairie BCR; these lists are provided in Attachment F-1.

F.4.3 State Priority Species

The Indiana Department of Natural Resources (Indiana DNR) and the Kentucky Department of Fish and Wildlife Resources (KDFWR) have identified species of greatest conservation need (Indiana DNR 2005; KDFWR 2013) (see Attachments F-2 and F-3). The Ohio Department of Natural Resources (ODNR) does not maintain a list of species of greatest conservation need. In Indiana, state priority species that occur commonly in the state and have the potential to be struck by rail cars include two bats, a bird, a frog, and a pocket gopher; specifically, these species are the eastern pipistrelle (*Pipistrellus subflavus*), little brown bat (*Myotis lucifugus*), whip-poor-will (*Caprimulgus vociferous*), northern leopard frog (*Rana pipiens*), and plains pocket gopher (*Geomys bursarius*) (Indiana DNR 2005). Some state priority species to consider in Kentucky based on range information include the American black bear (*Ursus americanus*), eastern hellbender (*Cryptobranchus alleganiensis*), four-toed salamander (*Hemidactylium scutatum*), northern dusky salamander (*Desmognathus fuscus*), redback salamander (*Plethodon cinereus*), streamside salamander (*Ambystoma barbouri*), and midland smooth softshell (*Apalone mutica*) (KDFWR 2013).

F.4.4 Game Species

Common game species in Indiana, Ohio, and Kentucky include cottontail rabbit (*Sylvilagus floridanus*), squirrel (*Sciurus carolinensis*), beaver (*Castor canadensis*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), mink (*Neovison vison*), muskrat (*Ondatra zibethicus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), pheasant (*Phasianus colchicus*), quail (*Colinus virginianus*), ruffed grouse (*Bonasa umbellus*), crow (*Corvus brachyrhynchos*), wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macroura*), waterfowl, and white-tailed deer (*Odocoileus virginianus*) (Indiana DNR 2013; ODNR 2014; KDFWR 2014). Game species that are hunted or trapped have a major impact on a state's economy by creating jobs and tax revenue. These common game species can be found in a variety of habitats, with the exception of beaver, mink, and muskrat, which are associated with waterways. Some of these game species are also commonly found in developed areas.

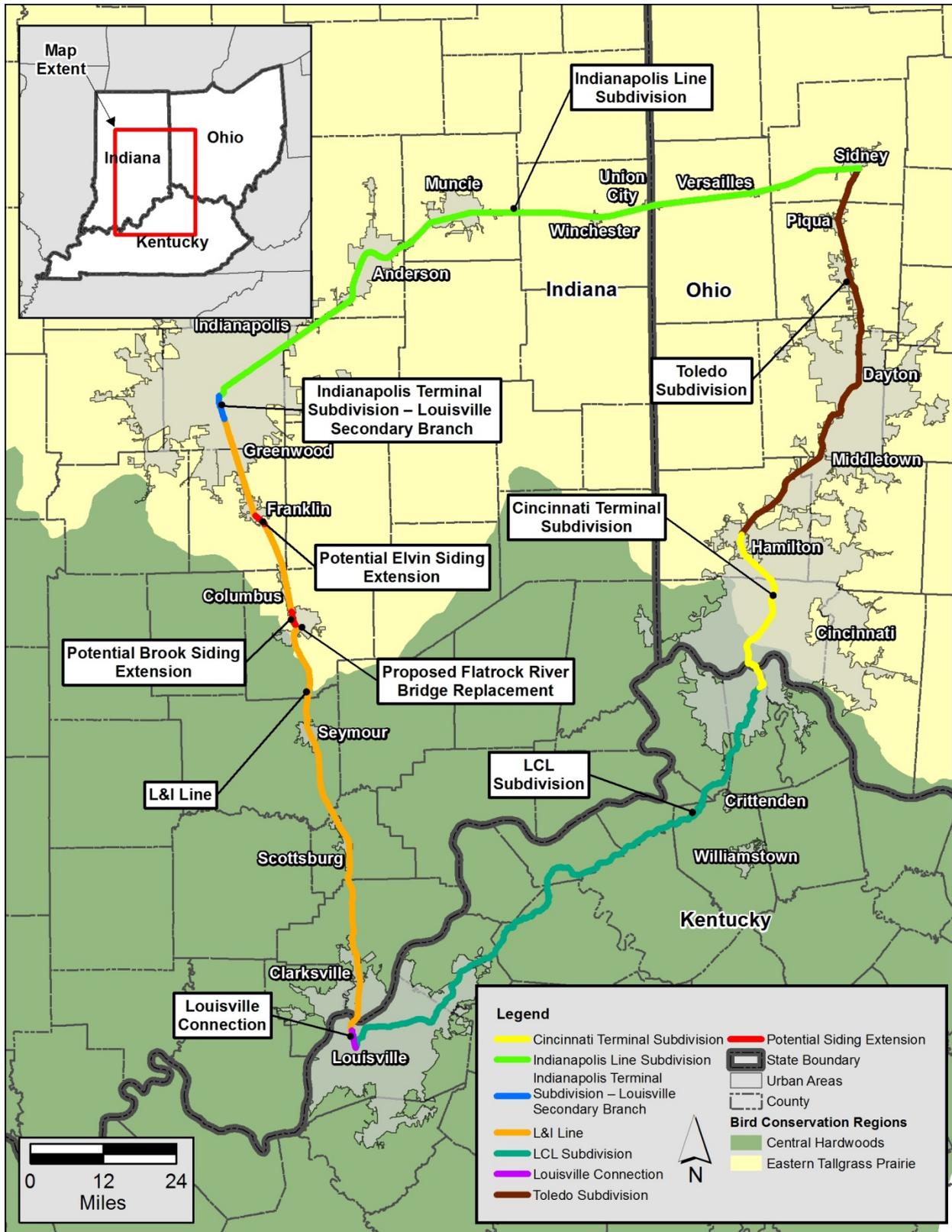


Figure F.4-1. USFWS Bird Conservation Regions

F.5 HABITAT IDENTIFICATION

As stated in Section F.3, there is no data on wildlife strikes along the rail lines in the project area or other rail lines in the region that can be directly used to identify species at risk and to calculate changes in the risk to those species based on changes in rail traffic volume or speed. Therefore, to evaluate potential effects on wildlife caused by the proposed shifts in rail traffic in the project area, land cover along the rail lines, as an indication of wildlife habitat, was evaluated and compared to determine whether trains would be operating more frequently through habitat where sensitive and vulnerable species are most likely to occur.

The 2011 National Land Cover Database (NLCD) (U.S. Geological Survey [USGS] 2014) was used to calculate the area of forested areas and other land cover types within 0.5 mile of the L&I Line, Indianapolis Line Subdivision, Toledo Subdivision/Cincinnati Terminal Subdivision, and LCL Subdivision, as shown in Table F.5-1 and Figures F.5-1 through F.5-4. This area is defined as the study area for the analysis of potential for wildlife strikes. For this analysis, the National Transportation Atlas Database's 2013 Railway Network (U.S. Department of Transportation [USDOT] 2013), was digitized to match aerial imagery. Table F.5-1 includes all of the land cover types in the NLCD, but for this analysis, shown graphically in Figure F.5-5, several land cover types have been combined into a single category. For example, forested areas include deciduous forest, evergreen forest, mixed forest, scrub-shrub, and woody wetlands; agricultural lands includes hay/pasture and cultivated crops; and developed areas includes barren land.

As shown in Table F.5-1 and Figure F.5-5, the L&I Line, along which rail traffic is proposed to increase from 2 to 7 trains per day to 17 to 20 trains per day and maximum train speeds would increase from 6 to 25 mph to 20 to 49 mph (see Table F.1-1, above), primarily crosses agricultural lands (45 percent cultivated crops and pasture) and developed areas (38 percent). About 17 percent of the land crossed by the L&I Line are forested areas. The Indianapolis Line Subdivision, where traffic is proposed to increase from 23 trains per day to 34 trains per day and speeds would remain the same (see Table F.1-1), also primarily crosses agricultural lands (51 percent) and developed areas (41 percent) (see Table F.5-1 and Figure F.5-5).

Land crossed by the Toledo Subdivision/Cincinnati Terminal Subdivision, where rail traffic would decrease from 28 to 31 trains per day to 17 to 20 trains per day (see Table F.1-1), is primarily developed areas (60 percent) and agricultural lands (25 percent) (see Table F.5-1 and Figure F.5-5). The LCL Subdivision, where traffic is proposed to decrease from 17 trains per day to 8 trains per day (see Table F.1-1), crosses primarily forested areas (42 percent), agricultural lands (29 percent), and developed areas (27 percent) (see Table F.5-1 and Figure F.5-5).

Combined, land crossed by the two lines on which traffic is proposed to increase is 48 percent agricultural lands, 40 percent developed areas, and 11 percent forested areas. Land use along the two lines where traffic would decrease is 27 percent agricultural lands, 43 percent developed areas, and 27 percent forested areas. Overall, the Proposed Transaction would result in a decrease in rail traffic through forested areas and an increase in traffic in areas with cultivated crops and pastures. There is a low occurrence of wetlands along all of the rail lines in the study area.

Table F.5-1. Land Cover along the Rail Lines in the Study Area

Land Cover ^a	L&I Line		Indianapolis Line Subdivision		Toledo Subdivision/ Cincinnati Terminal Subdivision		LCL Subdivision	
	Acres	% Total Area ^b	Acres	% Total Area ^b	Acres	% Total Area ^b	Acres	% Total Area ^b
<i>Total Area^c</i>	68,062	--	76,869	--	64,712	--	68,287	--
Deciduous Forest	10,913	16.0	3,830	5.0	6,518	10.0	27,050	39.6
Evergreen Forest	283	0.4	27	0.0	138	0.2	794	1.2
Mixed Forest	1	0.0	4	0.0	40	0.0	104	0.2
Shrub/Scrub	18	0.0	61	0.0	20	0.0	220	0.3
Woody Wetlands	51	0.0	102	0.1	31	0.0	407	0.5
Emergent Herbaceous Wetlands	58	0.0	218	0.3	395	0.6	98	0.1
Hay/Pasture	4,576	6.7	2,312	3.0	3,715	5.7	18,147	26.6
Herbaceous	409	0.6	1,108	1.4	218	0.3	867	1.3
Open Water	1,201	1.8	419	0.5	2,438	3.8	439	0.6
Cultivated Crops	24,909	36.6	37,165	48.3	12,407	19.2	1,706	2.5
Developed	25,546	37.5	31,577	41.1	38,533	59.5	18,432	27.0
Barren Land	97	0.1	46	0.0	259	0.4	23	0.0

Sources: USDOT, 2013, "National Transportation Atlas Database: Railway Network," Research and Innovative Technology Administration, Bureau of Transportation Statistics, accessed March 19, 2014, http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_atlas_database/2013/polyline.html.
 USGS, 2014, "National Land Cover Database 2011 (NLCD 2011)," Multi-Resolution Land Characteristics Consortium (MRLC), April 4, accessed April 25, 2014, <http://www.mrlc.gov/nlcd2011.php>.

Notes:

^a *Land cover designations are from the 2011 National Land Cover Database.*

^b *The % total areas do not equal 100 due to rounding.*

^c *The total area is the length of the rail line plus the area within 0.5 mile of the centerline of the rail line.*

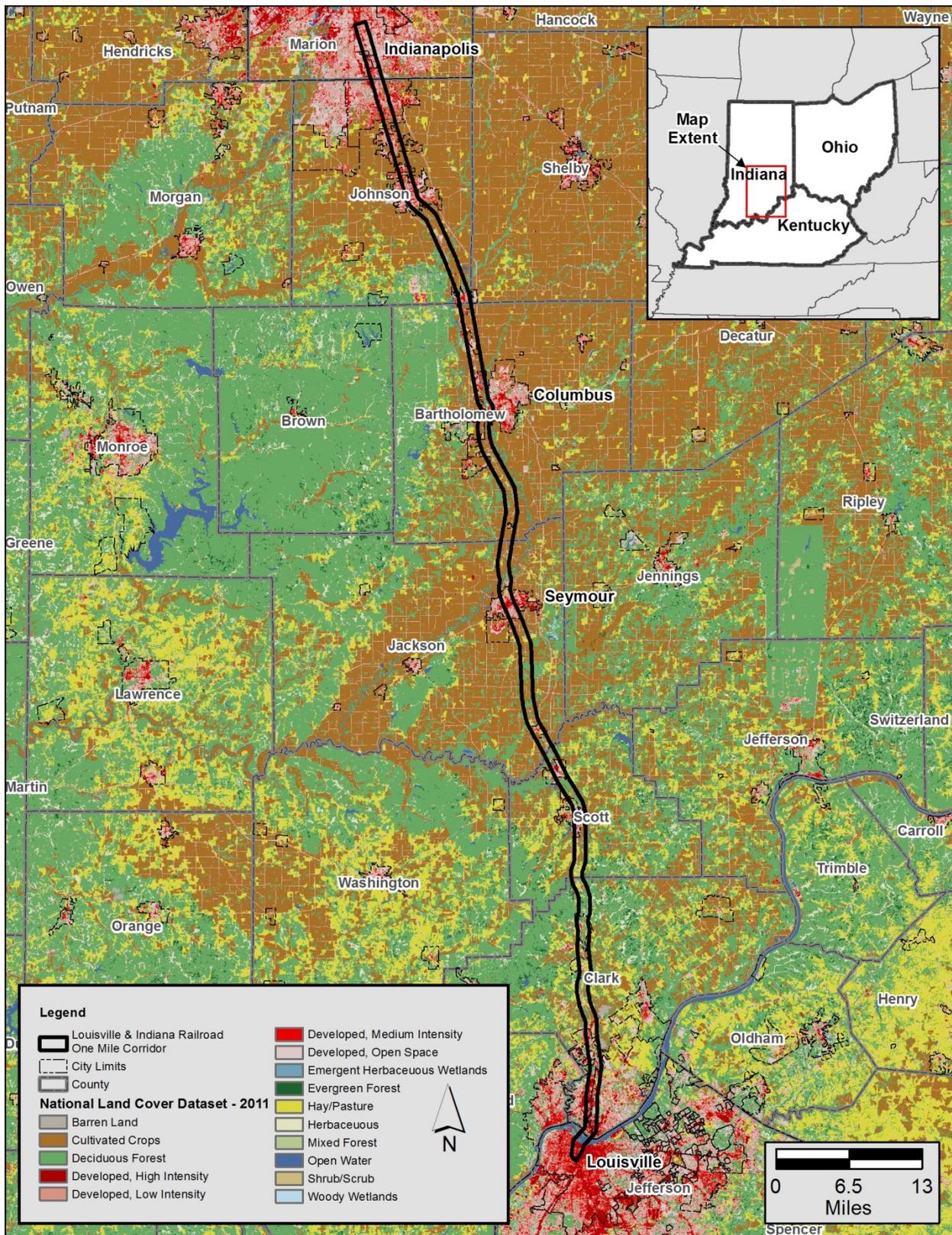


Figure F.5-1. Land Cover along the L&I Line

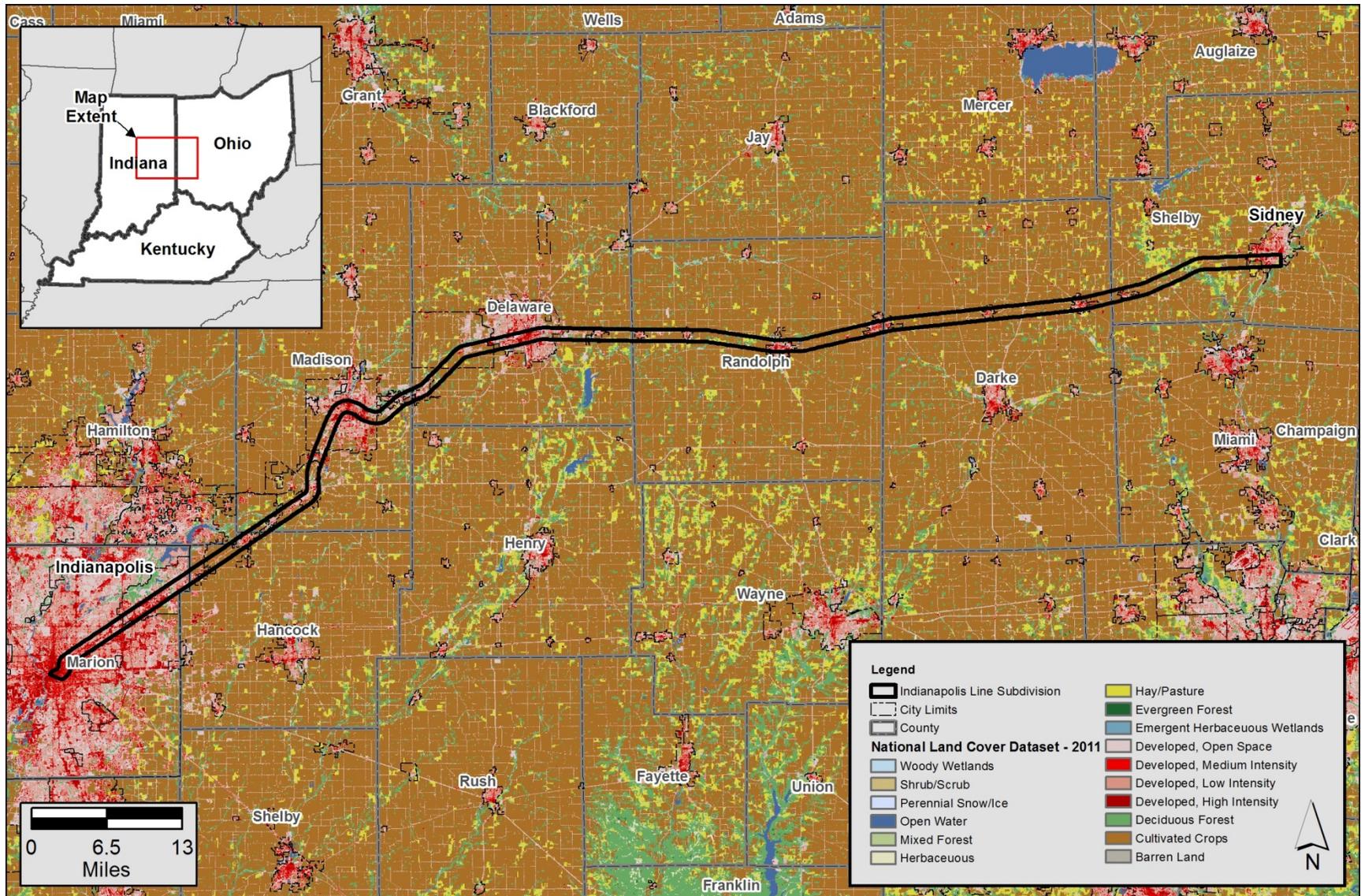


Figure F.5-2. Land Cover along the Indianapolis Line Subdivision

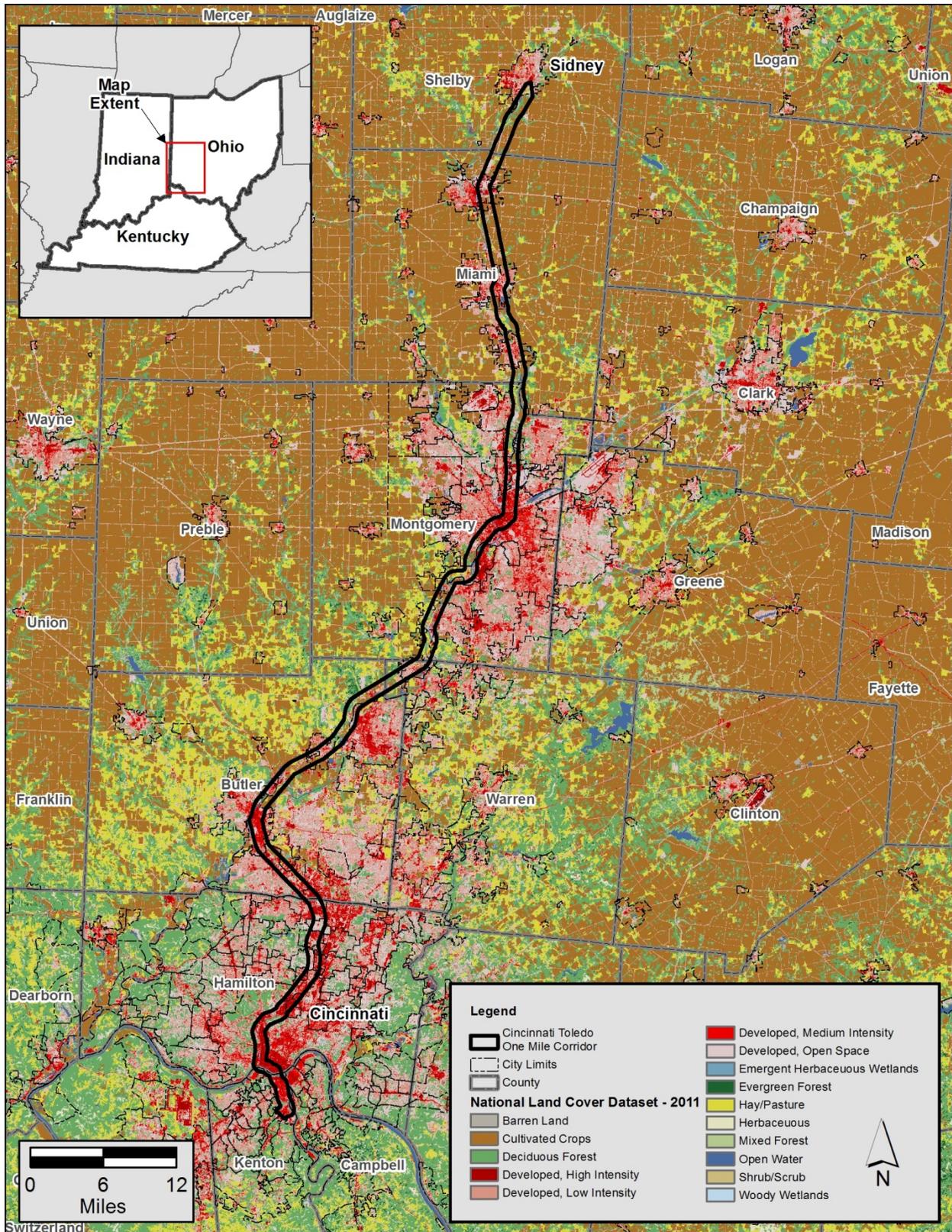


Figure F.5-3. Land Cover along the Toledo Subdivision/Cincinnati Terminal Subdivision

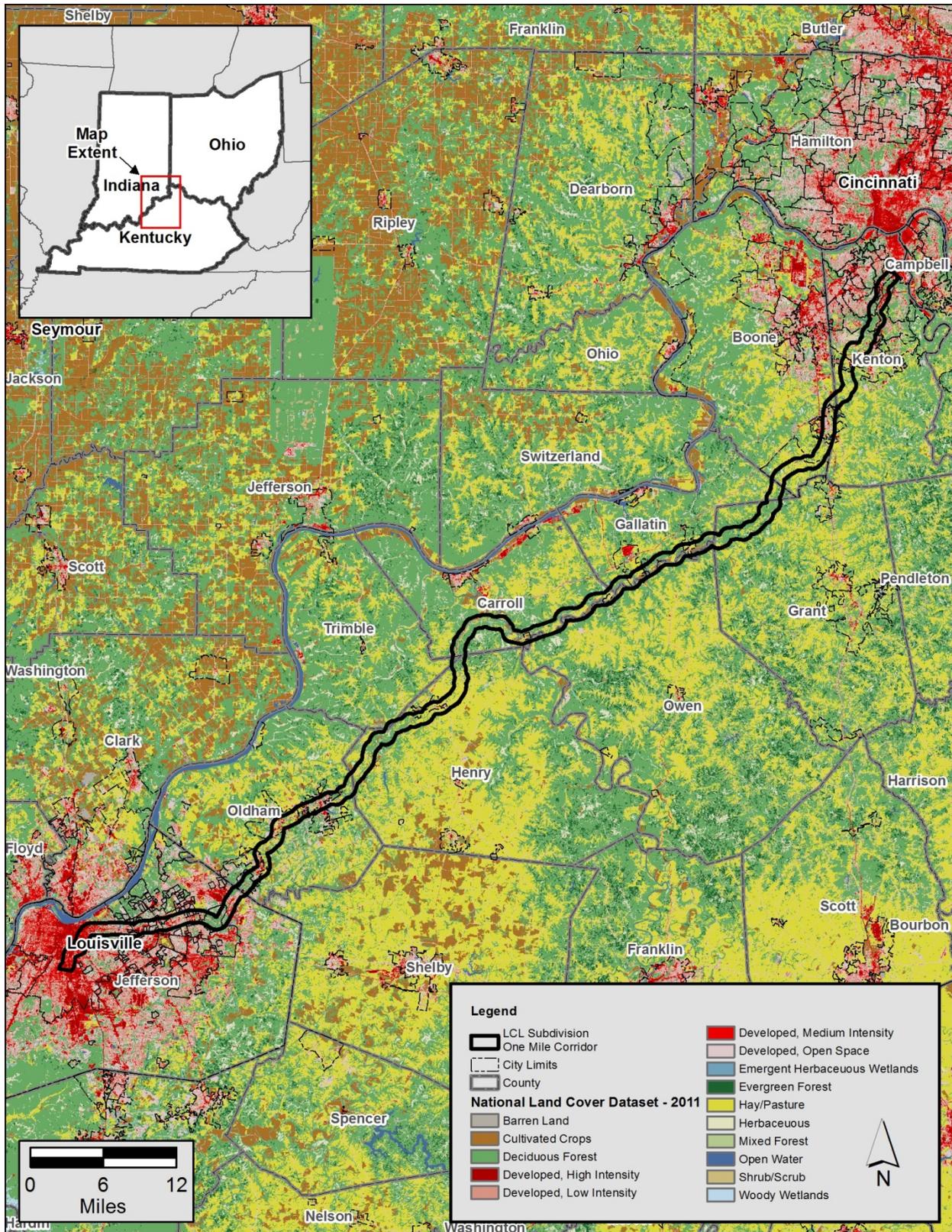


Figure F.5-4. Land Cover along the LCL Subdivision

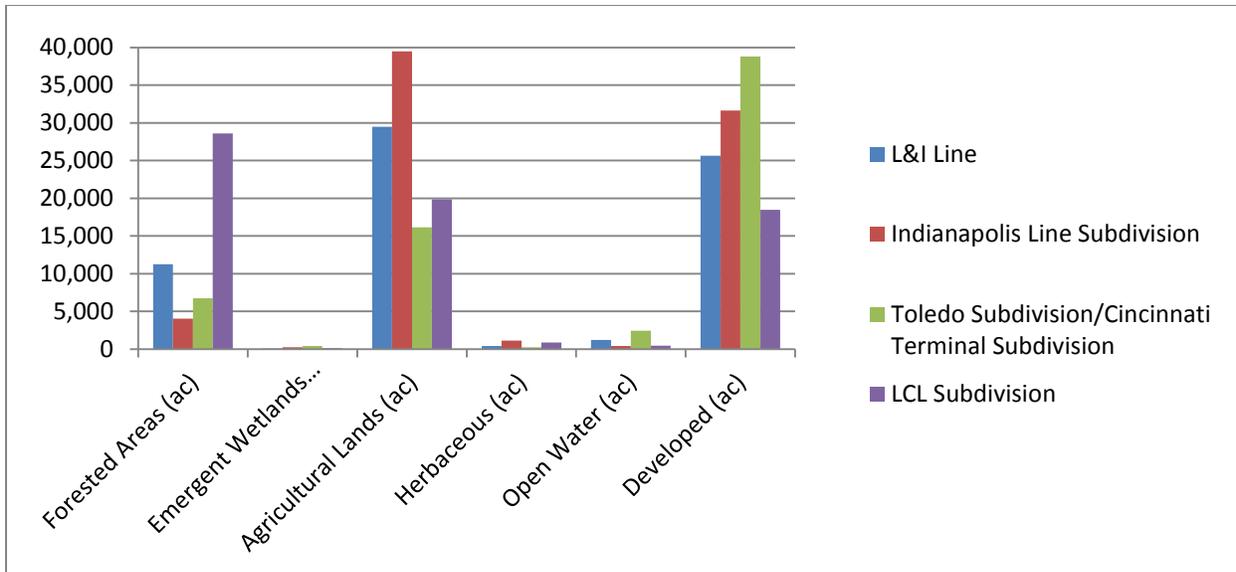


Figure F.5-5. Land Cover along the Rail Lines in the Study Area (in acres)

F.6 EFFECT OF THE PROPOSED TRANSACTION ON WILDLIFE STRIKES

Based on the land cover that occurs along each rail line in the study area, and the sensitive and vulnerable species that have the potential to occur in each land cover type, the effect of the Proposed Transaction on the risk of wildlife strikes was analyzed.

F.6.1 Forested Areas

The likelihood of wildlife strikes probably is higher in forested areas than other common land cover types along the rail lines in the study area. This is because forested areas are less disturbed, have more natural habitat conditions, have less human activity, and have a greater species diversity and abundance than other common land cover types. Forested areas also generally have a higher abundance of large wildlife, such as deer, that are known to be at risk of being struck by trains. In addition, the presence of dense and more diverse vegetation along the travel corridor, which has been implicated as a contributing factor in wildlife-vehicle collisions (Found and Boyce 2011), is higher in forested areas. Therefore, train activity in forested areas would have a greater likelihood of adversely affecting wildlife due to the increased likelihood of wildlife strike.

Forested areas are most abundant along the LCL Subdivision, where train traffic would be reduced, and less abundant along the L&I Line and the Indianapolis Line Subdivision, where train traffic would increase. Thus, the risk to wildlife in forested areas could decrease under the Proposed Transaction. Some species that could benefit from the decrease in train traffic along forested areas are the American black bear (there are county occurrence records in Boone and Henry counties in Kentucky), the state-listed timber rattlesnake (*Crotalus horridus*) and southeastern crowned snake (*Tantilla coronata*), the Indiana bat, and the Northern long-eared bat.

As described in Section F.3, it has been documented that bald eagles, which nest and roost in forested habitat, have been struck by trains, although how often this occurs or whether bald

eagles have been harmed along any of the rail lines analyzed here is unknown. Bald eagles have been found in all of the counties along the L&I Line and some of the counties along the Indianapolis Line Subdivision (Castrale 2014). However, forested areas makes up only about 17 percent of the land cover along the L&I Line, so the rate of encountering bald eagles may be limited. Bald eagles are uncommon in the portions of southwest Ohio where the Indianapolis Line Subdivision and the Cincinnati Terminal Subdivision are located, but breeding pairs in the state continue to increase (ODNR 2012). There has been only one occurrence of a bald eagle in the counties that the LCL Subdivision crosses (KDFWR 2005). Because bald eagles are uncommon throughout the study area, it is unlikely that a shift in rail traffic would have any detectable effect on this species.

F.6.2 Developed Areas and Agricultural Lands

Substantial portions of all rail lines in the study area cross developed land and land in agricultural production. Minimal wildlife habitat is present in developed areas and agricultural lands, and the habitat that may be present is frequently degraded or in small, fragmented blocks. Low habitat diversity and high fragmentation leads to low species richness. Studies have found that although birds frequent croplands, relatively few species can successfully nest there (Hopper 2003). Along the L&I Line and the Indianapolis Line Subdivision, where train traffic would increase, a substantial portion of the rail lines cross developed areas and agricultural lands. On the Toledo Subdivision/Cincinnati Terminal Subdivision, where train traffic would decrease, the land cover is developed areas and agricultural lands. Conversely, on the LCL Subdivision, where train traffic would decrease, there is less developed land and cultivated crops, and more forested areas and hay/pasture lands. There is a possibility that more birds would be struck by trains on the rail lines with increased train traffic. However, due to higher land cover type diversity along the LCL Subdivision, those strikes have the potential to be offset by the decline in rate of strikes on the LCL Subdivision.

F.6.3 Wetlands

As noted in Table F.5-1, the NLCD indicates a low occurrence of emergent wetlands and open water along all of the rail lines in the study area. Therefore, it is likely that there would be low occurrence of state-listed species or state priority species that use that habitat, such as Kirtland's snake (*Clonophis kirtlandii*), eastern slender glass lizard (*Ophisaurus attenuates*), copperbelly water snake (*Nerodia erythrogaster*), Eastern mud turtle (*Kinostemon subrubrum*), spotted turtle (*Clemmys guttata*), Blanding's turtle (*Thamnophis butleri*), eastern massasauga (*Sistrurus catenatus*), midland smooth softshell, northern leopard frog, and eastern hellbender or other species of salamander.

F.7 SUMMARY

The most common land cover types found along the L&I Line and the Indianapolis Line Subdivision, where train traffic would increase, are agricultural lands, developed areas, and forested areas. Combined, land crossed by those two rail lines is 48 percent agricultural lands, 40 percent developed areas, and 11 percent forested areas. In contrast, land cover types along the Toledo Subdivision/Cincinnati Terminal Subdivision and the LCL Subdivision, where traffic would decrease, is 27 percent agricultural lands, 43 percent developed areas, and 27 percent forested areas. Therefore, the Proposed Transaction would result in a decrease in rail traffic through forested areas, and an increase in traffic in areas with cultivated crops and pastures.

Because forested areas generally have higher diversity and abundance of wildlife, the Proposed Transaction could result in a decreased risk of wildlife being struck by operating trains in the project area. However, because of the absence of data on the rate of wildlife strikes and on which species of wildlife are impacted, it is not possible to predict more accurately how rates of wildlife strikes would change as a result of shifts in rail traffic or changes in the speed of operating trains under the Proposed Transaction.

F.8 REFERENCES

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**BIRDS OF THE CENTRAL HARDWOODS AND EASTERN TALLGRASS PRAIRIE
BIRD CONSERVATION REGIONS**

Table 22 BCR 24 (Central Hardwoods) *BCC 2008* list.²⁴

Bald Eagle (b)
Peregrine Falcon (b)
Black Rail
Solitary Sandpiper (nb)
Buff-breasted Sandpiper (nb)
Short-eared Owl (nb)
Whip-poor-will
Red-headed Woodpecker
Loggerhead Shrike
Bell's Vireo (c)
Brown-headed Nuthatch
Bewick's Wren (*bewickii* ssp.)
Sedge Wren
Wood Thrush
Blue-winged Warbler
Prairie Warbler
Cerulean Warbler
Worm-eating Warbler
Swainson's Warbler
Kentucky Warbler
Bachman's Sparrow
Henslow's Sparrow
LeConte's Sparrow (nb)
Smith's Longspur (nb)
Painted Bunting
Rusty Blackbird (nb)

24 (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR

Table 20 BCR 22 (Eastern Tallgrass Prairie) *BCC 2008* list.²²

Pied-billed Grebe	Dickcissel
Horned Grebe (nb)	Rusty Blackbird (nb)
American Bittern	
Least Bittern	
Black-crowned Night-Heron	
Bald Eagle (b)	
Peregrine Falcon (b)	
Black Rail	
Solitary Sandpiper (nb)	
Upland Sandpiper	
Whimbrel (nb)	
Hudsonian Godwit (nb)	
Marbled Godwit (nb)	
Red Knot (<i>roselaari</i> ssp.) (nb)	
Red Knot (<i>rufa</i> ssp.) (a) (nb)	
Buff-breasted Sandpiper (nb)	
Short-billed Dowitcher (nb)	
Black Tern	
Common Tern	
Black-billed Cuckoo	
Short-eared Owl (nb)	
Whip-poor-will	
Red-headed Woodpecker	
Northern Flicker	
Acadian Flycatcher	
Loggerhead Shrike	
Bell's Vireo (c)	
Bewick's Wren (<i>bewickii</i> ssp.)	
Wood Thrush	
Blue-winged Warbler	
Cerulean Warbler	
Prothonotary Warbler	
Kentucky Warbler	
Field Sparrow	
Grasshopper Sparrow	
Henslow's Sparrow	
Smith's Longspur (nb)	

22 (a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR

INDIANA SPECIES OF GREATEST CONSERVATION NEED

Appendix J. Species of Greatest Conservation Need in Indiana and Associated Habitat Types.

Range (within state):

Statewide (I), North (N), South (S), West (W), East (E), Central (C) and various combinations.

Relative abundance (within state):

Abundant (A), Common (C), Occasional (O), Rare (R)

Status

Extirpated (Ex), Exotic- accidentally or deliberately released species (X)

(Federal)

Federally Endangered (FE), Federally Threatened (FT), candidates for federal listing (FC)

(State)

State Endangered (SE), State Threatened (ST), Special Concern in need of further study (SC), WL = Watch list

Seasonal Occurrence (for birds):

Summer resident (S), winter resident (W), year-round resident (R), migrant (M), accidental (A), hypothetical (H), and breeder (*), former breeders [*].

Species bold - indicates Representative Species

Habitat type	Scientific name	Common Name	Range	Relative Abundance	Season	Status
Agriculture	<i>Tyto alba</i>	Barn Owl	I	R	R*	SE
Agriculture	<i>Rana areolata</i>	Crawfish Frog	W	O		SE
Agriculture	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot Toad	S	O		SC
Agriculture	<i>Rana pipiens</i>	Northern Leopard Frog	N, E	C		SC
Agriculture	<i>Terrapene ornata</i>	Ornate Box Turtle	NW, SW	O		SE
Agriculture	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Agriculture	<i>Grus canadensis</i>	Sandhill Crane	I	O	M*	SC
Aquatic Systems	<i>Emydoidea blandingii</i>	Blanding's Turtle	N	O		SE
Aquatic Systems	<i>Ambystoma laterale</i>	Blue-Spotted Salamander	N	O		SC
Aquatic Systems	<i>Necturus maculosus</i>	Common Mudpuppy	I	O		SC
Aquatic Systems	<i>Nerodia erythrogaster neglecta</i>	Copperbelly Water Snake	SW, NE, SC	O		SE, FC
Aquatic Systems	<i>Agkistrodon piscivorus</i>	Cottonmouth	S	R		SE
Aquatic Systems	<i>Kinosternon subrubrum</i>	Eastern Mud Turtle	NW, SW	R		SE
Aquatic Systems	<i>Hemidactylium scutatum</i>	Four-Toed Salamander	N, C	R		SE
Aquatic Systems	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Aquatic Systems	<i>Lontra canadensis</i>	River Otter	I	R		SC
Aquatic Systems	<i>Clemmys guttata</i>	Spotted Turtle	N	O		SE

Aquatic Systems Dunes and Shorelines	<i>Sterna antillarum</i>	Least Tern	I	R	S*	SE, FE
Aquatic Systems Dunes and Shorelines	<i>Charadrius melodus</i>	Piping Plover	I	R	A(*)	SE, FE
Aquatic Systems Impoundments	<i>Haliaeetus leucocephalus</i>	Bald Eagle	I	R	R*	SE, FT
Aquatic Systems Impoundments	<i>Chlidonias niger</i>	Black Tern	I	O	S*	SE
Aquatic Systems Impoundments	<i>Pandion haliaetus</i>	Osprey	I	R	S*	SE
Aquatic Systems Impoundments	<i>Falco peregrinus</i>	Peregrine Falcon	I	R	R*	SE
Aquatic Systems Impoundments	<i>Cygnus buccinator</i>	Trumpeter Swan	I	R	W(*)	SE
Aquatic Systems Kettle Lakes	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Aquatic Systems Lake Michigan	<i>Coregonus clupeaformis</i>	Lake Whitefish	NW	C		SC
Aquatic Systems Lake Michigan	<i>Rhinichthys cataractae</i>	Longnose Dace	N	O		SC
Aquatic Systems Lake Michigan	<i>Catostomus catostomus</i>	Longnose Sucker	NW	R		SC
Aquatic Systems Lake Michigan	<i>Falco peregrinus</i>	Peregrine Falcon	I	R	R*	SE
Aquatic Systems Lake Michigan	<i>Cottus cognatus</i>	Slimy Sculpin	NW	R		SC
Aquatic Systems Lake Michigan	<i>Percopsis omiscomaycus</i>	Trout-Perch	NW, S	R		SC
Aquatic Systems Natural Lakes	<i>Coregonus artedi</i>	Cisco	NW	R		SC
Aquatic Systems Natural Lakes	<i>Notropis anogenus</i>	Pugnose Shiner	NE	1945		SC
Aquatic Systems Oxbows/Backwaters/Sloughs/Embayments	<i>Elassoma zonatum</i>	Banded Pygmy Sunfish	SW	R		SC
Aquatic Systems Oxbows/Backwaters/Sloughs/Embayments	<i>Lepomis symmetricus</i>	Bantam Sunfish	W	R		SE
Aquatic Systems Oxbows/Backwaters/Sloughs/Embayments	<i>Etheostoma proeliare</i>	Cypress Darter	SW	R		SC
Aquatic Systems Rivers and Streams	<i>Haliaeetus leucocephalus</i>	Bald Eagle	I	R	R*	SE, FT
Aquatic Systems Rivers and Streams	<i>Sterna antillarum</i>	Least Tern	I	R	S*	SE, FE
Aquatic Systems Rivers and Streams	<i>Pandion haliaetus</i>	Osprey	I	R	S*	SE
Aquatic Systems Rivers and Streams Great Lakes Drainage Great River	<i>Venustaconcha ellipsiformis</i>	Ellipse				SC
Aquatic Systems Rivers and Streams Great Lakes Drainage Great River	<i>Moxostoma valenciennesi</i>	Greater Redhorse	N	R		SE
Aquatic Systems Rivers and Streams Great Lakes Drainage Headwater	<i>Ichthyomyzon fossor</i>	Northern Brook Lamprey	NE	R		SE
Aquatic Systems Rivers and Streams Great Lakes Drainage Wadeable/ Large River	<i>Campeloma decisum</i>	Pointed Campeloma				SC

Aquatic Systems Rivers and Streams Kankakee River (Illinois River) Drainage Wadeable/ Large River	<i>Notropis dorsalis</i>	Bigmouth Shiner	NW	R		SC
Aquatic Systems Rivers and Streams Kankakee River (Illinois River) Drainage/Wadeable/Large River	<i>Lymnaea stagnalis</i>	Swamp Lymnaea				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Headwater	<i>Clinostomus elongatus</i>	Redside Dace	E	R		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Pleurobema clava</i>	Clubshell				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Percina evides</i>	Gilt Darter	C	O		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Cryptobranchus alleganiensis</i>	Hellbender	S	R		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Ptychobranchus fasciolaris</i>	Kidneyshell				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Villosa lienosa</i>	Little Spectaclecase				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Esox masquinongy ohioensis</i>	Ohio River Muskellunge	S	R		SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Toxolasma lividus</i>	Purple Lilliput				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Quadrula cylindrica cylindrica</i>	Rabbitsfoot				SE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Villosa fabalis</i>	Rayed Bean				SC, FC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Obovaria subrotunda</i>	Round Hickorynut				SC

Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Simpsonaias ambigua</i>	Salamander Mussel				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Plethobasus cyphus</i>	Sheepnose				SE, FC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Epioblasma triquetra</i>	Snuffbox				SE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Etheostoma maculatum</i>	Spotted Darter	C	R		SC
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Etheostoma variatum</i>	Variagate Darter	SE	R		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Eastern Corn Belt/Interior Plateau Ecoregions Wadeable/Large River	<i>Lampsilis fasciola</i>	Waveyrayed Lampmussel				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Percina copelandi</i>	Channel Darter	C	R		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Cyprogenia stegaria</i>	Eastern Fanshell				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Potamilus capax</i>	Fat Pocketbook				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Acipenser fulvescens</i>	Lake Sturgeon	W, S	R		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Fusconaia subrotunda</i>	Longsolid				SE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Noturus stigmosus</i>	Northern Madtom	W, C	R		SC
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Pleurobema cordatum</i>	Ohio Pigtoe				SC
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Plethobasus cooperianus</i>	Orangefoot Pimpleback				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Lampsilis abrupta</i>	Pink Mucket				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Pleurobema rubrum</i>	Pyramid Pigtoe				SE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Pleurobema plenum</i>	Rough Pigtoe				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Etheostoma tippecanoe</i>	Tippecanoe Darter	C	R		SC
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Epioblasma torulosa torulosa</i>	Tubercled Blossom				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Ammocrypta clara</i>	Western Sand Darter	NW, S	O		SC
Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Epioblasma obliquata perobliqua</i>	White Catspaw				SE, FE

Aquatic Systems Rivers and Streams Ohio River Drainage Great River	<i>Plethobasus cicatricosus</i>	White Wartyback				SE, FE
Aquatic Systems Rivers and Streams Ohio River Drainage Interior River Lowland Wadeable/Large River	<i>Macrochelys temmincki</i>	Alligator Snapping Turtle	SW	R		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Interior River Lowland Wadeable/Large River	<i>Pseudemys concinna</i>	Hieroglyphic River Cooter	SW	1950		SE
Aquatic Systems Rivers and Streams Ohio River Drainage Interior River Lowland Wadeable/Large River	<i>Hybopsis amnis</i>	Pallid Shiner	W	R		SE
Barren Lands	<i>Rana areolata</i>	Crawfish Frog	W	O		SE
Barren Lands	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Barren Lands Bare Dunes	<i>Charadrius melodus</i>	Piping Plover	I	R	A(*)	SE, FE
Barren Lands Cliffs	<i>Neotoma magister</i>	Allegheny Woodrat	SC	R		SE
Barren Lands Cliffs	<i>Aneides aeneus</i>	Green Salamander	SE	R		SE
Developed Lands	<i>Chordeiles minor</i>	Common Nighthawk	I	O	S*	SC
Developed Lands	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot Toad	S	O		SC
Developed Lands	<i>Clonophis kirtlandii</i>	Kirtland's Snake	N, C, SE	O		SE
Developed Lands	<i>Liochlorophis vernalis</i>	Smooth Green Snake	NW	R		SE
Developed Lands Industrial Lands	<i>Chordeiles minor</i>	Common Nighthawk	I	O	S*	SC
Developed Lands Industrial Lands	<i>Falco peregrinus</i>	Peregrine Falcon	I	R	R*	SE
Forests	<i>Tyto alba</i>	Barn Owl	I	R	R*	SE
Forests	<i>Mniotilta varia</i>	Black-And-White Warbler	I	O	S*	SC
Forests	<i>Ambystoma laterale</i>	Blue-Spotted Salamander	N	O		SC
Forests	<i>Lynx rufus</i>	Bobcat	I	R		SC
Forests	<i>Buteo platypterus</i>	Broad-Winged Hawk	I	O	S*	SC
Forests	<i>Nerodia erythrogaster neglecta</i>	Copperbelly Water Snake	SW, NE, SC	O		SE, FC
Forests	<i>Pipistrellus subflavus</i>	Eastern Pipistrelle	S	C		SC
Forests	<i>Lasiurus borealis</i>	Eastern Red Bat	I	A		SC
Forests	<i>Nycticeius humeralis</i>	Evening Bat	SC	O		SE

Forests	<i>Hemidactylum scutatatum</i>	Four-Toed Salamander	N, C	R		SE
Forests	<i>Lasiurus cinereus</i>	Hoary Bat	I	O		SC
Forests	<i>Wilsonia citrina</i>	Hooded Warbler	I	R	S*	SC
Forests	<i>Myotis sodalists</i>	Indiana Myotis	I	O		SE, FE
Forests	<i>Clonophis kirtlandii</i>	Kirtland's Snake	N, C, SE	O		SE
Forests	<i>Mustela nivalis</i>	Least Weasel	N	R		SC
Forests	<i>Myotis lucifugus</i>	Little Brown Myotis	I	C		SC
Forests	<i>Ictinia mississippiensis</i>	Mississippi Kite	I	R	A*	SC
Forests	<i>Myotis septentrionalis</i>	Northern Myotis	I	C		SC
Forests	<i>Sorex hoyi</i>	Pygmy Shrew	SC	O		SC
Forests	<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-Eared Bat	SC	R		SC
Forests	<i>Pseudotriton ruber</i>	Red Salamander	SC	R		SE
Forests	<i>Ophedryx aestivus</i>	Rough Green Snake	S	O		SC
Forests	<i>Cemophora coccinea</i>	Scarlet Snake	S	R		SE
Forests	<i>Lasionycteris noctivagans</i>	Silver-Haired Bat	I	O		SC
Forests	<i>Sorex fumeus</i>	Smoky Shrew	SC	O		SC
Forests	<i>Liochlorophis vernalis</i>	Smooth Green Snake	NW	R		SE
Forests	<i>Myotis austroriparius</i>	Southeastern Myotis	SC	R		SE
Forests Early Forest Stage	<i>Vermivora chrysoptera</i>	Golden-Winged Warbler	I	R	S*	SE
Forests Early Forest Stage	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	I	C	S*	SC
Forests Evergreen	<i>Dendroica kirtlandii</i>	Kirtland's Warbler	I	R	M	SE, FE
Forests Evergreen	<i>Accipiter striatus</i>	Sharp-Shinned Hawk	I	O	R*	SC
Forests Floodplain Forests	<i>Dendroica cerulea</i>	Cerulean Warbler	I	O	S*	SC
Forests Forested Wetlands	<i>Dendroica cerulea</i>	Cerulean Warbler	I	O	S*	SC
Forests Mature or High Canopy Stage	<i>Neotoma magister</i>	Allegheny Woodrat	SC	R		SE
Forests Mature or High Canopy Stage	<i>Dendroica cerulea</i>	Cerulean Warbler	I	O	S*	SC
Forests Mature or High Canopy Stage	<i>Crotalus horridua</i>	Timber Rattlesnake	S	R		SE
Forests Old Forest Stage	<i>Neotoma magister</i>	Allegheny Woodrat	SC	R		SE
Forests Old Forest Stage	<i>Dendroica cerulea</i>	Cerulean Warbler	I	O	S*	SC

Forests Riparian Wooded Corridors/Streams	<i>Haliaeetus leucocephalus</i>	Bald Eagle	I	R	R*	SE, FT
Forests Riparian Wooded Corridors/Streams	<i>Nycticorax nycticorax</i>	Black-Crowned Night-Heron.	I	R	S*	SE
Forests Riparian Wooded Corridors/Streams	<i>Dendroica cerulea</i>	Cerulean Warbler	I	O	S*	SC
Forests Riparian Wooded Corridors/Streams	<i>Myotis grisescens</i>	Gray Myotis	SC	R		SE, FE
Forests Riparian Wooded Corridors/Streams	<i>Ardea alba</i>	Great Egret	I	O	S*	SC
Forests Riparian Wooded Corridors/Streams	<i>Pandion haliaetus</i>	Osprey	I	R	S*	SE
Forests Riparian Wooded Corridors/Streams	<i>Buteo lineatus</i>	Red-Shouldered Hawk	I	O	R*	SC
Forests Riparian Wooded Corridors/Streams	<i>Nyctanassa violacea</i>	Yellow-Crowned Night-Heron	SW	R	S*	SE
Forests Upland	<i>Neotoma magister</i>	Allegheny Woodrat	SC	R		SE
Forests Upland	<i>Chordeiles minor</i>	Common Nighthawk	I	O	S*	SC
Forests Upland	<i>Aneides aeneus</i>	Green Salamander	SE	R		SE
Forests Upland	<i>Tantilla coronata</i>	Southeastern Crowned Snake	S	R		SE
Forests Upland	<i>Helmitheros vermivorum</i>	Worm-Eating Warbler	I	R	S*	SC
Grasslands	<i>Botaurus lentiginosus</i>	American Bittern	I	R	S*	SE
Grasslands	<i>Taxidea taxus</i>	Badger	I	R		SC
Grasslands	<i>Tyto alba</i>	Barn Owl	I	R	R*	SE
Grasslands	<i>Emydoidea blandingii</i>	Blanding's Turtle	N	O		SE
Grasslands	<i>Ambystoma laterale</i>	Blue-Spotted Salamander	N	O		SC
Grasslands	<i>Lynx rufus</i>	Bobcat	I	R		SC
Grasslands	<i>Thamnophis butleri</i>	Butler's Garter Snake	NE, C	R		SE
Grasslands	<i>Rana areolata</i>	Crawfish Frog	W	O		SE
Grasslands	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot Toad	S	O		SC
Grasslands	<i>Spermophilus franklinii</i>	Franklin's Ground Squirrel	NW	R		SE
Grasslands	<i>Ammodramus henslowii</i>	Henslow's Sparrow	I	R	S*	SE
Grasslands	<i>Clonophis kirtlandii</i>	Kirtland's Snake	N, C, SE	O		SE
Grasslands	<i>Mustela nivalis</i>	Least Weasel	N	R		SC
Grasslands	<i>Lanius ludovicianus</i>	Loggerhead Shrike	I	R	R*	SE

Grasslands	<i>Circus cyaneus</i>	Northern Harrier	I	O	R*	SE
Grasslands	<i>Rana pipiens</i>	Northern Leopard Frog	N, E	C		SC
Grasslands	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Grasslands	<i>Geomys bursarius</i>	Plains Pocket Gopher	NW	C		SC
Grasslands	<i>Cistothorus platensis</i>	Sedge Wren	I	R	S*	SE
Grasslands	<i>Asio flammeus</i>	Short-Eared Owl	I	R	R*	SE
Grasslands	<i>Liochlorophis vernalis</i>	Smooth Green Snake	NW	R		SE
Grasslands	<i>Clemmys guttata</i>	Spotted Turtle	N	O		SE
Grasslands	<i>Bartramia longicauda</i>	Upland Sandpiper	I	R	S*	SE
Grasslands	<i>Sturnella neglecta</i>	Western Meadowlark	N	R	R*	SC
Grasslands	<i>Thamnophis proximus</i>	Western Ribbon Snake	NW, SW	O		SC
Grasslands Early Successional Areas	<i>Spermophilus franklinii</i>	Franklin's Ground Squirrel	NW	R		SE
Grasslands Farm Bill Programs	<i>Ammodramus henslowii</i>	Henslow's Sparrow	I	R	S*	SE
Grasslands Prairies	<i>Spermophilus franklinii</i>	Franklin's Ground Squirrel	NW	R		SE
Grasslands Vegetated Dunes and Swales	<i>Terrapene ornata</i>	Ornate Box Turtle	NW, SW	O		SE
Subterranean Systems Cave Entrances	<i>Hemidactylum scutatum</i>	Four-Toed Salamander	N, C	R		SE
Subterranean Systems Cave Entrances	<i>Aneides aeneus</i>	Green Salamander	SE	R		SE
Subterranean Systems Caves	<i>Pipistrellus subflavus</i>	Eastern Pipistrelle	S	C		SC
Subterranean Systems Caves	<i>Myotis grisescens</i>	Gray Myotis	SC	R		SE, FE
Subterranean Systems Caves	<i>Myotis sodalis</i>	Indiana Myotis	I	O		SE, FE
Subterranean Systems Caves	<i>Myotis lucifugus</i>	Little Brown Myotis	I	C		SC
Subterranean Systems Caves	<i>Amblyopsis spelaea</i>	Northern Cavefish	S	R		SE
Subterranean Systems Caves	<i>Myotis septentrionalis</i>	Northern Myotis	I	C		SC
Subterranean Systems Caves	<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-Eared Bat	SC	R		SC
Subterranean Systems Caves	<i>Myotis austroriparius</i>	Southeastern Myotis	SC	R		SE
Wetlands Emergent	<i>Botaurus lentiginosus</i>	American Bittern	I	R	S*	SE
Wetlands Emergent	<i>Laterallus jamaicensis</i>	Black Rail	I	R	A*	SE
Wetlands Emergent	<i>Chlidonias niger</i>	Black Tern	I	O	S*	SE

Wetlands Emergent	<i>Nycticorax nycticorax</i>	Black-Crowned Night-Heron.	I	R	S*	SE
Wetlands Emergent	<i>Gallinula chloropus</i>	Common Moorhen	I	R	S*	SE
Wetlands Emergent	<i>Ardea alba</i>	Great Egret	I	O	S*	SC
Wetlands Emergent	<i>Rallus elegans</i>	King Rail	I	R	S*	SE
Wetlands Emergent	<i>Ixobrychus exilis</i>	Least Bittern	I	R	S*	SE
Wetlands Emergent	<i>Cistothorus palustris</i>	Marsh Wren	I	R	S*	SE
Wetlands Emergent	<i>Grus canadensis</i>	Sandhill Crane	I	O	M*	SC
Wetlands Emergent	<i>Cistothorus platensis</i>	Sedge Wren	I	R	S*	SE
Wetlands Emergent	<i>Cygnus buccinator</i>	Trumpeter Swan	I	R	W(*)	SE
Wetlands Emergent	<i>Rallus limicola</i>	Virginia Rail	I	R	R*	SE
Wetlands Emergent	<i>Grus americana</i>	Whooping Crane	N		M	SE, FE
Wetlands Emergent	<i>Nyctanassa violacea</i>	Yellow-Crowned Night-Heron	SW	R	S*	SE
Wetlands Emergent	<i>Xanthocephalus xanthocephalus</i>	Yellow-Headed Blackbird	W, S	R	S*	SE
Wetlands Ephemeral	<i>Ambystoma laterale</i>	Blue-Spotted Salamander	N	O		SC
Wetlands Ephemeral	<i>Lynx rufus</i>	Bobcat	I	R		SC
Wetlands Ephemeral	<i>Rana areolata</i>	Crawfish Frog	W	O		SE
Wetlands Ephemeral	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot Toad	S	O		SC
Wetlands Ephemeral	<i>Hemidactylum scutatum</i>	Four-Toed Salamander	N, C	R		SE
Wetlands Ephemeral	<i>Rana pipiens</i>	Northern Leopard Frog	N, E	C		SC
Wetlands Ephemeral	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Wetlands Ephemeral	<i>Condylura cristata</i>	Star-Nosed Mole	NE	R		SC
Wetlands Herbaceous Marsh	<i>Emydoidea blandingii</i>	Blanding's Turtle	N	O		SE
Wetlands Herbaceous Marsh	<i>Thamnophis butleri</i>	Butler's Garter Snake	NE, C	R		SE
Wetlands Herbaceous Marsh	<i>Nerodia erythrogaster neglecta</i>	Copperbelly Water Snake	SW, NE, SC	O		SE, FC
Wetlands Herbaceous Marsh	<i>Agkistrodon piscivorus</i>	Cottonmouth	S	R		SE
Wetlands Herbaceous Marsh	<i>Rana areolata</i>	Crawfish Frog	W	O		SE
Wetlands Herbaceous Marsh	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot Toad	S	O		SC
Wetlands Herbaceous Marsh	<i>Sistrurus catenatus</i>	Massasauga	N	R		SE
Wetlands Herbaceous Marsh	<i>Rana pipiens</i>	Northern Leopard Frog	N, E	C		SC
Wetlands Herbaceous Marsh	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Wetlands Herbaceous Marsh	<i>Lutra canadensis</i>	River Otter	I	R		SC

Wetlands Herbaceous Marsh	<i>Clemmys guttata</i>	Spotted Turtle	N	O		SE
Wetlands Herbaceous Marsh	<i>Condylura cristata</i>	Star-Nosed Mole	NE	R		SC
Wetlands Herbaceous Marsh	<i>Farancia abacura</i>	Western Mud Snake				SE
Wetlands Herbaceous Marsh	<i>Thamnophis proximus</i>	Western Ribbon Snake	NW, SW	O		SC
Wetlands Permanent	<i>Emydoidea blandingii</i>	Blanding's Turtle	N	O		SE
Wetlands Permanent	<i>Lynx rufus</i>	Bobcat	I	R		SC
Wetlands Permanent	<i>Nerodia erythrogaster neglecta</i>	Copperbelly Water Snake	SW, NE, SC	O		SE, FC
Wetlands Permanent	<i>Agkistrodon piscivorus</i>	Cottonmouth	S	R		SE
Wetlands Permanent	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot Toad	S	O		SC
Wetlands Permanent	<i>Hemidactylium scutatum</i>	Four-Toed Salamander	N, C	R		SE
Wetlands Permanent	<i>Sistrurus catenatus</i>	Massasauga	N	R		SE
Wetlands Permanent	<i>Rana pipiens</i>	Northern Leopard Frog	N, E	C		SC
Wetlands Permanent	<i>Rana blairi</i>	Plains Leopard Frog	W	R		SC
Wetlands Permanent	<i>Lutra canadensis</i>	River Otter	I	R		SC
Wetlands Permanent	<i>Condylura cristata</i>	Star-Nosed Mole	NE	R		SC
Wetlands Permanent	<i>Sylvilagus aquaticus</i>	Swamp Rabbit	SW	R		SE
Wetlands Permanent	<i>Farancia abacura</i>	Western Mud Snake				SE
Wetlands Shrub/ Scrub	<i>Vermivora chrysoptera</i>	Golden-Winged Warbler	I	R	S*	SE

KENTUCKY SPECIES OF GREATEST CONSERVATION NEED

Appendix 1.1 Kentucky's Species of Greatest Conservation Need (SGCN) and their statuses.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Fish (64 species).					
Alabama Shad	<i>Alosa alabamae</i>	C	E	G3	S1
Alligator Gar	<i>Atractosteus spatula</i>	N	E	G3	S1
Ashy Darter	<i>Etheostoma cinereum</i>	N	S	G2	S3
Black Buffalo	<i>Ictiobus niger</i>	N	S	G5	S3
Blackfin Sucker	<i>Thoburnia atripinnis</i>	N	S	G2	S2
Blackside Dace	<i>Chrosomus cumberlandensis</i>	LT	T	G2	S2
Blacktail Redhorse	<i>Moxostoma poecilurum</i>	N	E	G5	S1
Blacktail Shiner	<i>Cyprinella venusta</i>	N	S	G5	S3
Bloodfin Darter	<i>Etheostoma sanguifluum</i>	N	N	G4	S4
Blotched Chub	<i>Erimystax insignis</i>	N	E	G3	S1
Blunface Shiner	<i>Cyprinella camura</i>	N	E	G5	S1
Brighteye Darter	<i>Etheostoma lynceum</i>	N	E	G5	S1
Brown Madtom	<i>Noturus phaeus</i>	N	E	G4	S1
Burbot	<i>Lota lota</i>	N	S	G5	N
Central Mudminnow	<i>Umbra limi</i>	N	T	G5	S2
Cumberland Arrow Darter	<i>Etheostoma sagitta</i>	N	N	G3	S4
Cumberland Darter	<i>Etheostoma susanae</i>	C	E	G2	S1
Cypress Darter	<i>Etheostoma proeliare</i>	N	T	G5	S2
Cypress Minnow	<i>Hybognathus hayi</i>	N	E	G5	S1
Dollar Sunfish	<i>Lepomis marginatus</i>	N	E	G5	S1
Emerald Darter	<i>Etheostoma baileyi</i>	N	N	G4	S4
Firebelly Darter	<i>Etheostoma pyrrhogaster</i>	N	E	G2	S1
Flathead Chub	<i>Platygobio gracilis</i>	N	S	G5	S1
Frecklebelly Darter	<i>Percina stictogaster</i>	N	N	G4	S4
Golden Topminnow	<i>Fundulus chrysotus</i>	N	E	G5	S1
Goldstripe Darter	<i>Etheostoma parvipinne</i>	N	E	G4	S1
Gulf Darter	<i>Etheostoma swaini</i>	N	E	G5	S1
Highland Rim Darter	<i>Etheostoma kantuckeense</i>	N	N	G4	S4
Kentucky Arrow Darter	<i>Etheostoma spilotum</i>	N	N	G3	S4
Kentucky Darter	<i>Etheostoma rafinesquei</i>	N	N	G4	S4
Lake Chubsucker	<i>Erimyzon sucetta</i>	N	T	G5	S2

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Lake Sturgeon	<i>Acipenser fulvescens</i>	N	E	G3	S1
Least Madtom	<i>Noturus hildebrandi</i>	N	E	G5	S1
Longhead Darter	<i>Percina macrocephala</i>	N	E	G3	S1
Mississippi Silverside	<i>Menidia audens</i>	N	N	G5	N/A
Northern Cavefish	<i>Amblyopsis spelaea</i>	N	S	G3	S3
Northern Madtom	<i>Noturus stigmosus</i>	N	S	G3	S2
Olive Darter	<i>Percina squamata</i>	N	E	G3	S1
Paddlefish	<i>Polyodon spathula</i>	N	N	G4	S4
Palezone Shiner	<i>Notropis albizonatus</i>	LE	E	G2	S1
Pallid Shiner	<i>Hybopsis amnis</i>	N	E	G4	N
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	LE	E	G1	S1
Plains Minnow	<i>Hybognathus placitus</i>	N	S	G4	S1
Redside Dace	<i>Clinostomus elongatus</i>	N	N	G4	S3
Redspotted Sunfish	<i>Lepomis miniatus</i>	N	T	G5	S2
Relict Darter	<i>Etheostoma chienense</i>	LE	E	G1	S1
Sawfin Shiner	<i>Notropis sp. 4</i>	N	E	G4	S1
Shawnee Darter	<i>Etheostoma tecumsehi</i>	N	S	G1	S3
Sicklefin Chub	<i>Macrhybopsis meeki</i>	N	E	G3	N
Slender Madtom	<i>Noturus exilis</i>	N	E	G5	S1
Smallscale Darter	<i>Etheostoma microlepidum</i>	N	E	G2	S1
Southern Cavefish	<i>Typhlichthys subterraneus</i>	N	S	G4	S2
Splendid Darter	<i>Etheostoma barrenense</i>	N	N	G4	S4
Spotted Darter	<i>Etheostoma maculatum</i>	N	T	G2	S2
Spring Cavefish	<i>Forbesichthys agassizii</i>	N	N	G4	S4
Stargazing Minnow	<i>Phenacobius uranops</i>	N	S	G4	S2
Starhead Topminnow	<i>Fundulus dispar</i>	N	E	G4	S1
Stone Darter	<i>Etheostoma derivativum</i>	N	N	G4	S4
Striped Darter	<i>Etheostoma virgatum</i>	N	N	G4	S4
Sturgeon Chub	<i>Macrhybopsis gelida</i>	N	E	G3	N
Swamp Darter	<i>Etheostoma fusiforme</i>	N	E	G5	S1
Taillight Shiner	<i>Notropis maculatus</i>	N	T	G5	S2
Tuxedo Darter	<i>Etheostoma lemniscatum</i>	LE	E	G1	S1
Western Sand Darter	<i>Ammocrypta clara</i>	N	E	G3	S1

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Lamprey (4 species).					
American Brook Lamprey	<i>Lampetra appendix</i>	N	T	G4	S2
Chestnut Lamprey	<i>Ichthyomyzon castaneus</i>	N	S	G4	S2
Mountain Brook Lamprey	<i>Ichthyomyzon greeleyi</i>	N	T	G3	S2
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	N	T	G4	S2

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Mussel (46 species).					
Bleufer	<i>Potamilus purpuratus</i>	N	E	G5	S1
Butterfly	<i>Ellipsaria lineolata</i>	N	N	G4	S4
Catspaw	<i>Epioblasma obliquata</i> <i>obliquata</i>	LE	E	G1	S1
Clubshell	<i>Pleurobema clava</i>	LE, XN	E	G2	S1
Cracking Pearlymussel	<i>Hemistena lata</i>	LE, XN	X	G1	S1
Creek Heelsplitter	<i>Lasmigona compressa</i>	N	E	G5	S1
Cumberland Bean	<i>Villosa trabalis</i>	LE, XN	E	G1	S1
Cumberland Elktoe	<i>Alasmidonta atropurpurea</i>	LE	E	G1	S1
Cumberland Moccasinshell	<i>Medionidus conradicus</i>	N	N	G3	S4
Cumberland Papershell	<i>Anodontoides denigratus</i>	N	E	G1	S1
Cumberlandian Combshell	<i>Epioblasma brevidens</i>	LE, XN	E	G1	S1
Dromedary Pearlymussel	<i>Dromus dromas</i>	LE, XN	E	G1	S1
Elephantear	<i>Elliptio crassidens</i>	N	N	G5	S4
Elktoe	<i>Alasmidonta marginata</i>	N	T	G4	S2
Fanshell	<i>Cyprogenia stegaria</i>	LE	E	G1	S1
Fat Pocketbook	<i>Potamilus capax</i>	LE	E	G1	S1
Fluted Kidneyshell	<i>Ptychobranhus subtentum</i>	PE	E	G2	S1
Green Floater	<i>Lasmigona subviridis</i>	N	X	G3	S1
Kentucky Creekshell	<i>Villosa ortmanni</i>	N	T	G2	S2
Little Spectaclecase	<i>Villosa lienosa</i>	N	S	G5	S3
Littlewing Pearlymussel	<i>Pegias fabula</i>	LE	E	G1	S1
Longsolid	<i>Fusconaia subrotunda</i> <i>subrotunda</i>	N	S	G3	S3
Mountain Creekshell	<i>Villosa vanuxemensis</i> <i>vanuxemensis</i>	N	T	G4	S2
Northern Riffleshell	<i>Epioblasma torulosa</i> <i>rangiana</i>	LE	E	G2	S1
Orangefoot Pimpleback	<i>Plethobasus cooperianus</i>	LE	E	G1	S1
Oyster Mussel	<i>Epioblasma capsaeformis</i>	LE, XN	E	G1	S1
Pink Mucket	<i>Lampsilis abrupta</i>	LE	E	G2	S1
Pocketbook	<i>Lampsilis ovata</i>	N	E	G5	S1
Purple Lilliput	<i>Toxolasma lividus</i>	N	E	G2	S1

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Pyramid Pigtoe	<i>Pleurobema rubrum</i>	N	E	G2	S1
Rabbitsfoot	<i>Quadrula cylindrica</i> <i>cylindrica</i>	PT	T	G3	S2
Rayed Bean	<i>Villosa fabalis</i>	E	X	G1	S1
Ring Pink	<i>Obovaria retusa</i>	LE	E	G1	S1
Rough Pigtoe	<i>Pleurobema plenum</i>	LE	E	G1	S1
Round Hickorynut	<i>Obovaria subrotunda</i>	N	N	G4	S4
Salamander Mussel	<i>Simpsonaias ambigua</i>	N	T	G3	S2
Scaleshell	<i>Leptodea leptodon</i>	LE	X	G1	S1
Sheepnose	<i>Plethobasus cyphus</i>	E	E	G3	S1
Slabside Pearlymussel	<i>Pleuronaia dolabelloides</i>	PE	X	G2	S1
Slippershell Mussel	<i>Alasmidonta viridis</i>	N	N	G4	S4
Snuffbox	<i>Epioblasma triquetra</i>	E	E	G3	S1
Spectacle Case	<i>Cumberlandia monodonta</i>	E	E	G2	S1
Tan Riffleshell	<i>Epioblasma florentina</i> <i>walkeri</i>	LE	E	G1	S1
Tennessee Clubshell	<i>Pleurobema oviforme</i>	N	E	G3	S1
Texas Lilliput	<i>Toxolasma texasiensis</i>	N	E	G4	S1
Winged Mapleleaf	<i>Quadrula fragosa</i>	LE, XN	X	G1	N

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Crayfish, Amphipod, Isopod, Shrimp (25 species).					
An Amphipod (stygobromus Vitreus)	<i>Stygobromus vitreus</i>	N	S	G4	S1
Appalachian Cave Crayfish	<i>Orconectes packardi</i>	N	T	G2	S2
Big Sandy Crayfish	<i>Cambarus veteranus</i>	N	S	G3	S1
Big South Fork Crayfish	<i>Cambarus bouchardi</i>	N	E	G2	S1
Blood River Crayfish	<i>Orconectes burri</i>	N	T	G2	S2
Bottlebrush Crayfish	<i>Barbicambarus cornutus</i>	N	S	G4	S2
Bousfield's Amphipod	<i>Gammarus bousfieldi</i>	N	E	G1	S1
Cajun Dwarf Crayfish	<i>Cambarellus shufeldtii</i>	N	S	G5	S2
Clifton Cave Isopod	<i>Caecidotea barri</i>	N	E	G1	S1
Crittenden Crayfish	<i>Orconectes bisectus</i>	N	T	G1	S1
Cumberland Plateau Cave Crayfish	<i>Orconectes barri</i>	N	T	G2	S2
Ghost Crayfish	<i>Orconectes inermis inermis</i>	N	S	G5	S3
Gray-speckled Crayfish	<i>Orconectes palmeri palmeri</i>	N	E	G5	S1
Hairy Crayfish	<i>Cambarus friaufi</i>	N	S	G4	S3
Livingston Crayfish	<i>Orconectes margorectus</i>	N	T	G2	S2
Longclaw Crayfish	<i>Cambarus buntingi</i>	N	S	G4	S3
Louisville Crayfish	<i>Orconectes jeffersoni</i>	N	E	G1	S1
Mammoth Cave Crayfish	<i>Orconectes pellucidus</i>	N	S	G4	S3
Mammoth Cave Shrimp	<i>Palaemonias ganteri</i>	LE	E	G1	S1
Mountain Midget Crayfish	<i>Cambarus parvocus</i>	N	T	G5	S2
Mud River Crayfish	<i>Orconectes ronaldi</i>	N	T	G3	S2
Ohio Shrimp	<i>Macrobrachium ohione</i>	N	E	G4	S1
Shrimp Crayfish	<i>Orconectes lancifer</i>	N	E	G5	S1
Swamp Dwarf Crayfish	<i>Cambarellus puer</i>	N	E	G5	S1
Vernal Crayfish	<i>Procambarus viaeviridis</i>	N	T	G5	S1

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Amphibian (25 species).					
Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>	N	N	G5	S4
Barking Treefrog	<i>Hyla gratiosa</i>	N	S	G5	S3
Bird-voiced Treefrog	<i>Hyla avivoca</i>	N	S	G5	S3
Black Mountain Salamander	<i>Desmognathus welteri</i>	N	N	G4	S4
Cumberland Plateau Salamander	<i>Plethodon kentucki</i>	N	N	G4	S4
Eastern Hellbender	<i>Cryptobranchus alleganiensis alleganiensis</i>	N	S	G3	S3
Eastern Spadefoot	<i>Scaphiopus holbrookii</i>	N	N	G5	S4
Four-toed Salamander	<i>Hemidactylium scutatum</i>	N	N	G5	S4
Gray Treefrog	<i>Hyla versicolor</i>	N	S	G5	S2
Green Salamander	<i>Aneides aeneus</i>	N	N	G3	S4
Green Treefrog	<i>Hyla cinerea</i>	N	S	G5	S3
Mole Salamander	<i>Ambystoma talpoideum</i>	N	N	G5	S3
Northern Crawfish Frog	<i>Rana areolata circulosa</i>	N	S	G4	S3
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	N	N	G5	S5
Northern Leopard Frog	<i>Rana pipiens</i>	N	S	G5	S3
Redback Salamander	<i>Plethodon cinereus</i>	N	S	G5	S3
Southern Leopard Frog	<i>Rana sphenocephala</i>	N	N	G5	S5
Southern Zigzag Salamander	<i>Plethodon ventralis</i>	N	N	G4	S4
Spotted Dusky Salamander	<i>Desmognathus conanti</i>	N	N	G5	S3
Streamside Salamander	<i>Ambystoma barbouri</i>	N	N	G4	S4
Three-lined Salamander	<i>Eurycea guttolineata</i>	N	T	G5	S2
Three-toed Amphiuma	<i>Amphiuma tridactylum</i>	N	E	G5	S1
Wehrle's Salamander	<i>Plethodon wehrlei</i>	N	E	G5	S1
Western Lesser Siren	<i>Siren intermedia nettingi</i>	N	N	G5	S3
Wood Frog	<i>Rana sylvatica</i>	N	N	G5	S5

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Bird (94 species).					
American Bittern	<i>Botaurus lentiginosus</i>	N	H	G4	S1
American Black Duck	<i>Anas rubripes</i>	N	N	G5	S4
American Golden-plover	<i>Pluvialis dominica</i>	N	N	G5	S3
American Kestrel	<i>Falco sparverius</i>	N	N	G5	S5
American White Pelican	<i>Pelecanus erythrorhynchos</i>	N	N	G3	S4
American Woodcock	<i>Scolopax minor</i>	N	N	G5	S4
Bachman's Sparrow	<i>Peucaea aestivalis</i>	N	E	G3	S1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	N	T	G4	S2
Bank Swallow	<i>Riparia riparia</i>	N	S	G5	S3
Barn Owl	<i>Tyto alba</i>	N	S	G5	S3
Bell's Vireo	<i>Vireo bellii</i>	PS	S	G5	S2
Bewick's Wren	<i>Thryomanes bewickii</i>	N	S	G5	S3
Black Tern	<i>Chlidonias niger</i>	N	X	G4	S1
Blackburnian Warbler	<i>Setophaga fusca</i>	N	T	G5	S1
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>	N	T	G5	S1
Black-necked Stilt	<i>Himantopus mexicanus</i>	PS	N	G5	N
Black-throated Green Warbler	<i>Setophaga virens</i>	N	N	G5	S4
Blue-winged Warbler	<i>Vermivora cyanoptera</i>	N	N	G5	S4
Bobolink	<i>Dolichonyx oryzivorus</i>	N	S	G5	S2
Brown Creeper	<i>Certhia americana</i>	N	E	G5	S1
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	N	N	G4	S3
Canada Warbler	<i>Cardellina canadensis</i>	N	S	G5	S3
Cerulean Warbler	<i>Setophaga cerulea</i>	N	N	G4	S4
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	N	N	G5	S4
Common Gallinule	<i>Gallinula galeata</i>	PS	T	G5	S1
Common Raven	<i>Corvus corax</i>	N	T	G5	S1
Common Tern	<i>Sterna hirundo</i>	N	N	G5	S3
Dickcissel	<i>Spiza americana</i>	N	N	G5	S4
Dunlin	<i>Calidris alpina</i>	N	N	G5	S4
Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	N	N	G5	S5
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	N	T	G4	S2

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	PS	N	G5	S4
Great Egret	<i>Ardea alba</i>	N	E	G5	S1
Greater Prairie-chicken	<i>Tympanuchus cupido</i>	PS	X	G4	N
Greater Scaup	<i>Aythya marila</i>	N	N	G5	S2
Henslow's Sparrow	<i>Ammodramus henslowii</i>	N	S	G4	S3
Hooded Merganser	<i>Lophodytes cucullatus</i>	N	T	G5	S1
Horned Grebe	<i>Podiceps auritus</i>	N	N	G5	S4
Interior Least Tern	<i>Sternula antillarum athalassos</i>	LE	E	G2	S2
Kentucky Warbler	<i>Geothlypis formosa</i>	N	N	G5	S5
King Rail	<i>Rallus elegans</i>	N	E	G4	S1
Lark Sparrow	<i>Chondestes grammacus</i>	N	T	G5	S2
Least Bittern	<i>Ixobrychus exilis</i>	N	T	G5	S1
Least Flycatcher	<i>Empidonax minimus</i>	N	E	G5	S1
Lesser Scaup	<i>Aythya affinis</i>	N	N	G5	S4
Lesser Yellowlegs	<i>Tringa flavipes</i>	N	N	G5	S4
Little Blue Heron	<i>Egretta caerulea</i>	N	E	G5	S1
Loggerhead Shrike	<i>Lanius ludovicianus</i>	PS	N	G4	S4
Long-eared Owl	<i>Asio otus</i>	N	E	G5	S1
Louisiana Waterthrush	<i>Parkesia motacilla</i>	N	N	G5	S5
Mississippi Kite	<i>Ictinia mississippiensis</i>	N	S	G5	S2
Northern Bobwhite	<i>Colinus virginianus</i>	PS	N	G5	S5
Northern Harrier	<i>Circus cyaneus</i>	N	T	G5	S1
Northern Pintail	<i>Anas acuta</i>	N	N	G5	S4
Osprey	<i>Pandion haliaetus</i>	N	T	G5	S2
Peregrine Falcon	<i>Falco peregrinus</i>	PS:LE	E	G4	S1
Pied-billed Grebe	<i>Podilymbus podiceps</i>	N	E	G5	S1
Piping Plover	<i>Charadrius melodus</i>	LE, LT	N	G3	S2
Prairie Warbler	<i>Setophaga discolor</i>	N	N	G5	S5
Prothonotary Warbler	<i>Protonotaria citrea</i>	N	N	G5	S5
Red-breasted Nuthatch	<i>Sitta canadensis</i>	N	E	G5	S1
Red-cockaded Woodpecker	<i>Picoides borealis</i>	LE	X	G3	N

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	N	N	G5	S4
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	N	S	G5	S3
Ruffed Grouse	<i>Bonasa umbellus</i>	N	N	G5	S4
Rusty Blackbird	<i>Euphagus carolinus</i>	N	N	G4	S3
Sanderling	<i>Calidris alba</i>	N	N	G5	S3
Sandhill Crane	<i>Grus canadensis</i>	PS	N	G5	N
Savannah Sparrow	<i>Passerculus sandwichensis</i>	N	S	G5	S2
Sedge Wren	<i>Cistothorus platensis</i>	N	S	G5	S3
Semipalmated Sandpiper	<i>Calidris pusilla</i>	N	N	G5	S4
Sharp-shinned Hawk	<i>Accipiter striatus</i>	PS	S	G5	S3
Short-billed Dowitcher	<i>Limnodromus griseus</i>	N	N	G5	S3
Short-eared Owl	<i>Asio flammeus</i>	N	E	G5	S1
Solitary Sandpiper	<i>Tringa solitaria</i>	N	N	G5	S4
Sora	<i>Porzana carolina</i>	N	N	G5	N
Spotted Sandpiper	<i>Actitis macularius</i>	N	E	G5	S1
Stilt Sandpiper	<i>Calidris himantopus</i>	N	N	G5	S3
Swainson's Warbler	<i>Limnithlypis swainsonii</i>	N	N	G4	S3
Swallow-tailed Kite	<i>Elanoides forficatus</i>	N	X	G5	N
Trumpeter Swan	<i>Cygnus buccinator</i>	N	X	G4	S4
Tundra Swan	<i>Cygnus columbianus</i>	N	N	G5	N
Upland Sandpiper	<i>Bartramia longicauda</i>	N	H	G5	S3
Vesper Sparrow	<i>Poocetes gramineus</i>	N	E	G5	S1
Virginia Rail	<i>Rallus limicola</i>	N	N	G5	S1
Western Sandpiper	<i>Calidris mauri</i>	N	N	G5	S3
Whooping Crane	<i>Grus americana</i>	LE, XN	X	G1	S4
Willow Flycatcher	<i>Empidonax traillii</i>	PS	N	G5	S3
Wilson's Phalarope	<i>Phalaropus tricolor</i>	N	N	G5	S3
Wilson's Snipe	<i>Gallinago delicata</i>	N	N	G5	S3
Wood Thrush	<i>Hylocichla mustelina</i>	N	N	G5	S5
Worm-eating Warbler	<i>Helmitheros vermivorum</i>	N	N	G5	S4
Yellow Rail	<i>Coturnicops noveboracensis</i>	N	N	G4	S3

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>	N	T	G5	S2



Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Mammal (16 species).					
Allegheny Woodrat	<i>Neotoma magister</i>	N	N	G3	S4
American Black Bear	<i>Ursus americanus</i>	PS	S	G5	S2
Appalachian Cottontail	<i>Sylvilagus obscurus</i>	N	N	G4	S2
Cinereus Shrew	<i>Sorex cinereus</i>	N	S	G5	S3
Cotton Mouse	<i>Peromyscus gossypinus</i>	PS	T	G5	S2
Eastern Small-footed Myotis	<i>Myotis leibii</i>	N	T	G3	S2
Eastern Spotted Skunk	<i>Spilogale putorius</i>	N	S	G5	S2
Evening Bat	<i>Nycticeius humeralis</i>	N	S	G5	S3
Gray Myotis	<i>Myotis grisescens</i>	LE	T	G3	S2
Indiana Bat	<i>Myotis sodalis</i>	LE	E	G2	S1
Kentucky Red-backed Vole	<i>Clethrionomys gapperi maurus</i>	N	S	G3	S3
Long-tailed Or Rock Shrew	<i>Sorex dispar blitchi</i>	N	E	G3	S1
Rafinesque's Big-eared Bat	<i>Corynorhinus rafinesquii</i>	N	S	G3	S3
Southeastern Myotis	<i>Myotis austroriparius</i>	N	E	G3	S1
Swamp Rabbit	<i>Sylvilagus aquaticus</i>	N	N	G5	S3
Virginia Big-eared Bat	<i>Corynorhinus townsendii virginianus</i>	LE	E	G2	S1

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Reptile (27 species).					
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	N	T	G3	S2
Broad-banded Water Snake	<i>Nerodia fasciata confluens</i>	N	E	G5	S1
Coal Skink	<i>Eumeces anthracinus</i>	N	T	G5	S2
Copperbelly Water Snake	<i>Nerodia erythrogaster neglecta</i>	PS:LT	S	G2	S3
Diamondback Water Snake	<i>Nerodia rhombifer rhombifer</i>	N	N	G5	S5
Eastern Coachwhip	<i>Masticophis flagellum flagellum</i>	N	X	G5	N
Eastern Corn Snake	<i>Elaphe guttata</i>	N	S	G5	S3
Eastern Mud Turtle	<i>Kinosternon subrubrum</i>	N	N	G5	S3
Eastern Ribbon Snake	<i>Thamnophis sauritus sauritus</i>	N	S	G5	S3
Eastern Slender Glass Lizard	<i>Ophisaurus attenuatus longicaudus</i>	N	T	G5	S2
False Map Turtle	<i>Graptemys pseudogeographica pseudogeographica</i>	N	N	G5	S3
Green Water Snake	<i>Nerodia cyclopion</i>	N	E	G5	S1
Kirtland's Snake	<i>Clonophis kirtlandii</i>	N	T	G2	S2
Midland Smooth Softshell	<i>Apalone mutica mutica</i>	N	S	G5	S3
Mississippi Map Turtle	<i>Graptemys pseudogeographica kohnii</i>	N	N	G4	S3
Northern Pine Snake	<i>Pituophis melanoleucus melanoleucus</i>	N	T	G4	S2
Northern Scarlet Snake	<i>Cemophora coccinea copei</i>	N	N	G5	S3
Scarlet Kingsnake	<i>Lampropeltis triangulum elapsoides</i>	N	S	G5	S3
Six-lined Racerunner	<i>Aspidoscelis sexlineata</i>	N	N	G5	S3
Southeastern Crowned Snake	<i>Tantilla coronata</i>	N	N	G5	S3
Southeastern Five-lined Skink	<i>Eumeces inexpectatus</i>	N	S	G5	S3
Southern Painted Turtle	<i>Chrysemys dorsalis</i>	N	T	G5	S2

Appendix 1.1 Continued.

Common name	Scientific name	Federal	Heritage	GRank	SRank
Timber Rattlesnake	<i>Crotalus horridus</i>	N	N	G4	S4
Western Cottonmouth	<i>Agkistrodon piscivorus leucostoma</i>	N	N	G5	S3
Western Mud Snake	<i>Farancia abacura reinwardtii</i>	N	S	G5	S3
Western Pygmy Rattlesnake	<i>Sistrurus miliarius streckeri</i>	N	T	G5	S2
Western Ribbon Snake	<i>Thamnophis proximus proximus</i>	N	T	G5	S1
