Illinois Wildlife Preservation Fund Grant
Final Report
Project 07-L13W *Illinois Threatened and Endangered Species* and *Habitats are Homes* Posters

In July 2006, the Illinois Department of Natural Resources' (IDNR) Division of Education was awarded a $5,400.00 grant from the Illinois Wildlife Preservation Fund for the purpose of producing two new posters, *Illinois Threatened and Endangered Species* and *Habitats are Homes*. These posters were to become a part of the *Illinois Flora, Fauna, Habitats and Culture* series of posters, supplemental educational resources that can be used at all grade levels.

Text for the posters was written by Valerie Keener of the IDNR Division of Education with support and review from Joe Kath, IDNR Endangered Species Project Manager, Glen Kruse, Chief of the IDNR Division of Natural Heritage and Bob Bluett, IDNR Wildlife Diversity Program Manager. For the *Illinois Threatened and Endangered Species* poster, the one-time right to use images was purchased from: B. Eugene Wofford, University of Tennessee (1); Daybreak Imagery, Alma, Illinois (4); VIREO, Philadelphia, Pennsylvania (1); Bat Conservation International, Austin, Texas (3); Rob Curtis, The Early Birder, Chicago (1); and Southern Illinois University, Carbondale (5). Other images for the poster were obtained at no charge: Dr. Frank Wilhelm, Southern Illinois University, Carbondale (1); Paul Labus, The Nature Conservancy, Wisconsin (1); Randy Nyboër, Illinois Endangered Species Protection Board, Savanna (1); Mike Redmer, U.S. Fish and Wildlife Service, Barrington (5); Ken Robertson, IDNR Illinois Natural History Survey, Champaign (3); Jochen Gerber, The Field Museum, Chicago (1); Everett D. Cashatt, Illinois State Museum, Springfield (1); and Kevin Cummings, IDNR Illinois Natural History Survey, Champaign (2). For the *Habitats are Homes* poster, all image rights were obtained at no charge from: William N. Roston (2); Russell Verbofsky/Painet, Inc. (1); Steven Wayne Rotsch/Painet, Inc. (1); and Adele Hodde, Manager, IDNR Photographic Services (19). Design and layout were provided by Dee Proctor (*Illinois Threatened and Endangered Species)* and Tim Gosteli (*Habitats are Homes*) of the Illinois Information Services Graphics Division, Central Management Services (CMS), State of Illinois. Following a competitive bidding process by CMS, the printing bid was awarded to Illinois Graphics, Bloomington. Posters were received by the IDNR in mid-July 2007.

Illinois Threatened and Endangered Species and *Habitats are Homes* help to supplement the Illinois State Board of Education's Illinois Learning Standards in Science (12A how living things function, adapt and change; 12B how living things interact with each other and with their environment). They may also be used to support Illinois Learning Standards in English Language Arts, Social Science and Fine Arts, depending upon how the instructor utilizes the posters. The front side of the *Illinois Threatened and Endangered Species* poster depicts 25 species that are endangered in Illinois and provides their taxonomic classification. The reverse side shows five additional Illinois endangered species and contains the following sections: Threatened/Endangered; Causes of Species Decline; What Can You Do to Help Threatened and Endangered Species?; References; Illinois' Threatened and Endangered Species; and Agency Resources. *Habitats are Homes* has photographs of 22 species in relation to one of the four main Illinois habitats that they utilize: prairie; woodland; aquatic; urban. Sections on the back of the

poster include: What is A Habitat?; Habitats are Homes; Schoolyard Habitat Action Grant; How Do Habitats Change?; Helping Habitats; Agency Resources; and For More Information. Posters are available through the IDNR online order form at http://www.idnrteachkids.com and are also distributed by the IDNR Division of Education at teacher conferences, ENTICE workshops and other events statewide. Ten thousand copies of each poster were printed.

Grant funds were used to help pay for the printing of the posters. Total printing cost was $5,911.00 with $5,400.00 from the Illinois Wildlife Preservation Fund Grant and the remainder ($511.00) paid from the IDNR Division of Education's ENTICE general revenue funds. ENTICE ($1,075.00) and Contractual general revenue ($300.00) funds were used to pay for the photographic rights, and general IDNR funds paid the design and layout costs (invoice not yet received). Personnel costs were paid by the IDNR.

The IDNR Division of Education is very grateful for the support of the Illinois Wildlife Preservation Fund.

Illinois

Threatened & Endangered Species

moccasin flower *Cypripedium acaule*
Photo © Kenneth R. Robertson

Rafinesque's big-eared bat *Corynorhinus rafinesquii*
Photo © Merlin D. Tuttle, Bat Conservation International, Inc.

Swainson's hawk *Buteo swainsoni*
Photo © Richard Day, Daybreak Imagery

taillight shiner *Notropis maculatus*
Photo © Matthew R. Thomas

alligator snapping turtle *Macrochelys temminckii*
Photo © Mike Redmer

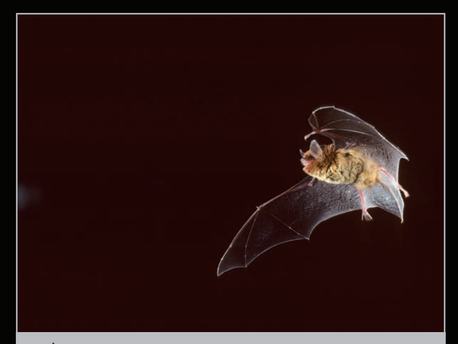
black rail *Laterallus jamaicensis*
Photo © Brian E. Small, VIREO

Illinois cave amphipod *Gammarus acherondytes*
Photo © Dr. Frank M. Wilhelm, Southern Illinois University, Carbondale

eastern massasauga *Sistrurus catenatus*
Photo © Mike Redmer

Indiana bat *Myotis sodalis*
Photo © Merlin D. Tuttle, Bat Conservation International, Inc.

northern madtom *Noturus stigmosus*
Photo © Matthew R. Thomas

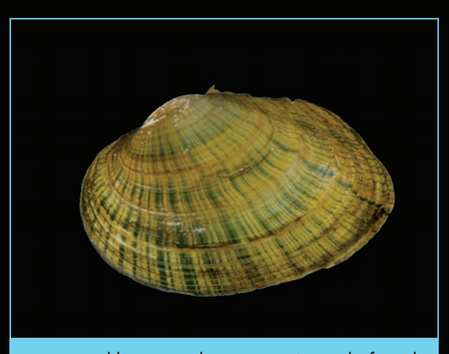


southeastern myotis *Myotis austroriparius*
Photo © Merlin D. Tuttle, Bat Conservation International, Inc.

northern brook lamprey *Ichthyomyzon fossor*
Photo © David J. Eisenhour

silvery salamander *Ambystoma platineum*
Photo © Mike Redmer

clubshell *Pleurobema clava*
Photo © Kevin S. Cummings



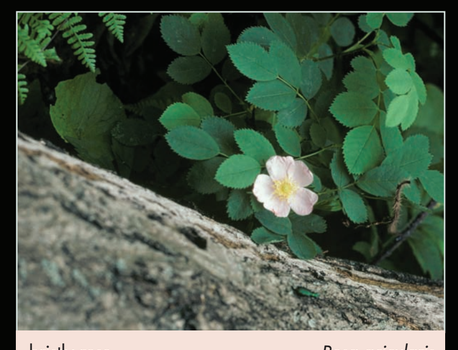
wavy-rayed lampmussel *Lampsilis fasciola*
Photo © Kevin S. Cummings

Bewick's wren *Thryomanes bewickii*
Photo © Todd Fink, Daybreak Imagery

sturgeon chub *Macrhybopsis gelida*
Photo © David J. Eisenhour

Illinois mud turtle *Kinosternon flavescens*
Photo © Mike Redmer

Iowa Pleistocene snail *Discus macclintocki*
Photo © Jochen Gerber, Field Museum



bristly rose *Rosa acicularis*
Photo © Randy Nyboer

Mead's milkweed *Asclepias meadii*
Photo © Kenneth R. Robertson

Hine's emerald dragonfly *Somatochlora hineana*
Photo © Everett D. Cashatt

piping plover *Charadrius melodus*
Photo © Richard Day, Daybreak Imagery

American mountain ash *Sorbus americana*
Photo © Kenneth R. Robertson

Karner blue butterfly *Lycaeides melissa samuelis*
Photo © Paul Labus, The Nature Conservancy

Species become threatened, endangered or extinct for a variety of reasons. In Illinois, the Endangered Species Protection Board (ESPB), in conjunction with the Illinois Department of Natural Resources' Office of Resource Conservation, is responsible for determining which species warrant inclusion on the state's threatened and endangered list. Through scientific research and population monitoring, the ESPB updates the list every five years. Species whose populations have decreased to dangerously low numbers and are extremely limited in distribution may be added to the list. Species that have shown population rebounds and are no longer threatened or endangered in Illinois may be removed from the list. Currently, more than 350 species are listed as endangered in Illinois and more than 125 are listed as threatened. It is possible that the status of the species depicted on this poster will change upon further review by the ESPB. Visit the Internet site at http://dnr.state.il.us/espb/index.htm for the most current listing of Illinois threatened and endangered species.

Species List

All species depicted on this poster are endangered in Illinois.

Species Selection:

Joseph A. Kath
Illinois Department of Natural Resources

Species are not shown in proportion to actual size.

taillight shiner	*Notropis maculatus*	
northern madtom	*Noturus stigmosus*	
*pallid shiner	*Hybopsis amnis*	
northern brook lamprey	*Ichthyomyzon fossor*	
sturgeon chub	*Macrhybopsis gelida*	
*spotted dusky salamander	*Desmognathus conanti*	
alligator snapping turtle	*Macrochelys temminckii*	
eastern massasauga	*Sistrurus catenatus*	
Illinois mud turtle	*Kinosternon flavescens*	
silvery salamander	*Ambystoma platineum*	
piping plover	*Charadrius melodus*	Federally endangered
*Swainson's warbler	*Limnothlypis swainsonii*	
black rail	*Laterallus jamaicensis*	
Bewick's wren	*Thryomanes bewickii*	
Swainson's hawk	*Buteo swainsoni*	
Indiana bat	*Myotis sodalis*	Federally endangered
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	
southeastern myotis	*Myotis austroriparius*	
*eastern wood rat	*Neotoma floridana*	
Iowa Pleistocene snail	*Discus macclintocki*	Federally endangered
Illinois cave amphipod	*Gammarus acherondytes*	Federally endangered
Hine's emerald dragonfly	*Somatochlora hineana*	Federally endangered
Karner blue butterfly	*Lycaeides melissa samuelis*	Federally endangered
clubshell	*Pleurobema clava*	Federally endangered
wavy-rayed lampmussel	*Lampsilis fasciola*	
Mead's milkweed	*Asclepias meadii*	Federally threatened
bristly rose	*Rosa acicularis*	
American mountain ash	*Sorbus americana*	
*screwstem	*Bartonia paniculata*	
moccasin flower	*Cypripedium acaule*	

*Species illustrated on the back of the poster.

This poster was made possible by:

Illinois Department of Natural Resources
Division of Education
Division of Natural Heritage

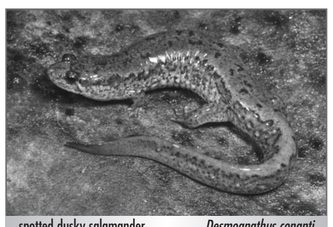
Illinois Wildlife Preservation Fund

Funding for this project was made possible in part by contributions to the Illinois Wildlife Preservation Fund.

Threatened/Endangered

When a species is listed as threatened, it is likely to become listed as endangered. The threatened classification indicates that populations are low enough or declining such that extinction is possible in the future. An endangered species is an organism that is in danger of becoming extinct within all or a portion of its range. A species listed as endangered by the state of Illinois is in danger of disappearing as a breeding species in the wild within the state. If a species is classified as endangered by the federal government, the situation is even more grave — the species is in danger of becoming extinct within the United States and possibly the world.

A species is included on the official Illinois list of threatened and endangered species when one or more of the following criteria exist: 1) it occurs in Illinois and is included in the federal list of threatened or endangered species; 2) it occurs in Illinois and is proposed for federal threatened or endangered species status; 3) it was formerly widespread in Illinois but has been nearly eliminated from the state due to habitat destruction, collecting or other stressors resulting from the development of Illinois; 4) it exhibits a very restricted geographic range, of which Illinois is a part; 5) it exhibits restricted habitats or low populations in Illinois; or 6) it has significant disjuncts in Illinois (that is, the Illinois population is far removed from the rest of the species' range).



spotted dusky salamander *Desmognathus conanti*
Photo © Mike Redmer

The federal Endangered Species Protection Act was passed in 1973, leading to federal and state laws to protect threatened and endangered species. A species listed by the federal government or the state of Illinois is by law not to be harmed, pursued, harassed, hunted, transported or traded. The U.S. Fish and Wildlife Service is responsible for determining which species warrant being listed as federally threatened or endangered.

In Illinois, the Endangered Species Protection Board (ESPB), in conjunction with the Illinois Department of Natural Resources' (IDNR) Office of Resource Conservation, is responsible for determining which organisms are threatened or endangered in the state. This panel also advises the IDNR on means of conserving those species. The ESPB consists of nine members who are appointed by the Governor. By law, the board must include two zoologists, two ecologists and one botanist. It convenes quarterly in open public meetings.

The ESPB funds research projects to gather information that will contribute to listing decisions or conservation strategies for various species. Board and IDNR staff conduct and participate in many field surveys annually to monitor the status of threatened and endangered species. The ESPB may remove from the list any non-federally listed species for which it finds satisfactory scientific evidence that its wild or natural populations are no longer threatened or endangered in the state.

It is possible that the status of the species depicted on this poster will change upon further review by the ESPB; the list is updated every five years. Visit the ESPB Web site at http://dnr.state.il.us/espb/index.htm for the most current listing of Illinois threatened and endangered species.

Causes of Species Decline

The two most common causes of species decline today are habitat loss and degradation of habitat. In Illinois, the loss of natural habitat has been tremendous. More than 90 percent of the natural wetlands, 80 percent of the forests and 99 percent of the natural prairies have been lost.

Habitats may be destroyed through a variety of methods, including damming rivers and streams, removing vegetation and introducing exotic species that out-compete native species. Much land has been converted to agricultural, industrial and urbanization uses. The effects of habitat change are not always seen immediately. More often, habitat loss and the resulting decline of species are indirectly caused and the result of cumulative impacts over a period of time.

Degradation of existing habitats has compounded the effects of habitat loss. Pollution and environmental contamination are forms of degradation that can have a devastating effect on native species. For example, the use of the insecticide DDT in the 1950s and 1960s led to serious reproductive problems for many species of birds, including the bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*) and peregrine falcon (*Falco peregrinus*). The problem was discovered in time to save the birds from extinction, and the use of DDT in the United States was banned in 1972. Its use continued in other countries, however, affecting migratory species.

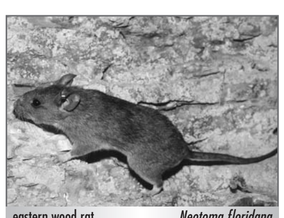
Other threats exist. Natural threats (predation, drought, lack of food, disease) are minimal when compared to threats caused by humans (chemicals, introduced species, illegal collection/killing, habitat destruction, domestic pets, obstructions such as tall buildings and dams). Much effort is expended by biologists in Illinois to remove threats posed by invasive introduced species. Human presence and use of the land have caused the extinction of some species, while other species have benefitted from human presence, actually increasing in numbers and range. Some species have thrived by human efforts to restore and manage them in their native habitats. Other species have such little native habitat remaining that management options are severely limited.

Extirpated and Extinct Species

Porcupines (*Erethizon dorsatum*), bison (*Bison bison*) and elk (*Cervus canadensis*) are among the many species that once lived in Illinois but no longer are found here in the wild. They do exist in other parts of the United States, however. These species which no longer have Illinois as part of their natural range are extirpated from the state. Extinct species are those that no longer exist anywhere on earth. Species that once lived in Illinois and that are now extinct include the Carolina parakeet (*Conuropsis carolinensis*) and passenger pigeon (*Ectopistes migratorius*).

What Can You Do to Help Threatened & Endangered Species?

- Because the greatest threat to wildlife is habitat loss, you can help by encouraging the creation and protection of wildlife habitat in the community. Plant a native wildflower garden and leave the flower heads and dead stems/leaves in place through the winter. Create a community garden or prairie. Encourage the use of retaining edges for wildlife on farm land. Build and install bird nest boxes. Where feasible, leave dead trees standing for wildlife to roost on, feed on and live in.
- Find out which endangered species live in your area and examine the causes of threats to them and their habitat.
- Write a letter to your elected representatives telling each that you care about threatened and endangered species and their protection. Conservation of natural resources may entail passage of laws. Your representatives should know how you feel.
- Contribute to organizations that help to preserve habitat or protect endangered species, such as the Illinois Wildlife Preservation Fund. You can contribute to this fund through the Illinois Department of Natural Resources or by using the check-off box when submitting your state income tax. The purchase of hunting and fishing licenses and habitat stamps also contributes to species protection.



eastern wood rat *Neotoma floridana*
Photo © Todd Fink, Daybreak Imagery

- If you see natural resources violations occur or know about someone who has violated a law regarding threatened or endangered species, report them to law enforcement officials.
- Boycott the purchase of wild-captured species.
- Even actions as simple as not disturbing what appears to be orphaned wildlife, practicing organic farming and using environmentally friendly pesticides are important.
- Volunteer to help with conservation projects in your area.

References

Cummings, K. S., and C. A. Mayer. 1992. *Field guide to freshwater mussels of the Midwest.* Illinois Natural History Survey Manual 5. 194 pp.

Herkert, J. R. editor. 1992. *Endangered and threatened species of Illinois: status and distribution, volume 2 - animals.* Illinois Endangered Species Protection Board, Springfield, Illinois. 142 pp.

Herkert, J. R., and J. E. Ebinger, editors. 2002. *Endangered and threatened species of Illinois: status and distribution, volume 1 - plants.* Illinois Endangered Species Protection Board, Springfield, Illinois. 161 pp.

Illinois Department of Natural Resources. 1994. *The changing Illinois environment: critical trends. Summary report of the critical trends assessment project.* http://www.dnr.state.il.us/orep/ctap/sumrepo/chap6/chap6t.htm

Illinois Endangered Species Protection Board. 2005. *Checklist of endangered and threatened animals and plants of Illinois.* Illinois Endangered Species Protection Board, Springfield, Illinois. 16 pp.

Nyboer, R. W., J. R. Herkert, and J. E. Ebinger, editors. 2006. *Endangered and threatened species of Illinois: status and distribution, volume 2 - animals.* Illinois Endangered Species Protection Board, Springfield, Illinois. 181 pp.

Page, L. M., and B. M. Burr. 1991. *A field guide to freshwater fishes.* Houghton Mifflin Company, Boston. 432 pp.

Phillips, C. A., R. A. Brandon, and E. O. Moll. 1999. *Field guide to amphibians and reptiles of Illinois.* Illinois Natural History Survey Manual 8. 282 pp.

Illinois' Threatened & Endangered Species

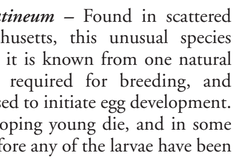
Thirty of the more than 480 species currently listed as endangered and threatened in Illinois are depicted on this poster. Many groups of organisms are not even considered for endangered and threatened listing because not enough information is available about them.

FISHES

northern brook lamprey *Ichthyomyzon fossor* – A fish of the Great Lakes and Ohio and Missouri river basins, the northern brook lamprey is known in Illinois from the Kankakee River. It requires clear, clean flowing water. Siltation and other pol-lutants leading to water quality degradation have hurt this species' ability to survive.

northern madtom *Noturus stigmosus* – Known only from two Illinois counties (east central and southeast), this species is declining throughout its United States range. It prefers sand and rock riffles in large rivers. Improved soil conservation practices to reduce siltation, turbidity and pollution would benefit this species' survival.

pallid shiner *Hybopsis amnis* – Formerly occurring in many of the large river systems in Illinois as well as in much of the Mississippi River's drainage system, its Illinois range has been reduced to the Mississippi and Kankakee rivers. It is intolerant of siltation and turbidity and has declined rapidly as land use practices have changed.



pallid shiner *Hybopsis amnis*
Photo © Matthew R. Thomas

sturgeon chub *Macrhybopsis gelida* – Found in the central United States, the sturgeon chub is fairly uncommon in most of its range. It prefers areas of swift, shallow water over sand and gravel substrate. Degraded water quality and siltation are factors affecting this species.

taillight shiner *Notropis maculatus* – Found throughout the south-eastern United States, the taillight shiner is at the northern edge of its range in Illinois, occurring only in the southern tip of the state. It prefers to live near vegetation in swamps, ponds and rivers. It has never been widespread in Illinois, and loss and degradation of habitat have hurt its ability to survive.

REPTILES & AMPHIBIANS

alligator snapping turtle *Macrochelys temminckii* – The largest freshwater turtle in North America, this species has been the victim of habitat degradation and excessive killing by humans. A plan to restore the alligator snapping turtle to its native rivers, oxbow lakes and cypress swamps in the state is being implemented by the IDNR.

eastern massasauga *Sistrurus catenatus* – Once common in the northern two-thirds of Illinois, this venomous species relies on old fields, floodplain forests, prairie marshes and bogs. Destruction of prairie marshes and agricultural practices have destroyed its habitat. It is now known from only approximately eight locations in Illinois.

Illinois mud turtle *Kinosternon flavescens* – A species of more western habitats, the Illinois mud turtle lives in sand prairies with ponds and sloughs. In recent years, its Illinois populations have declined greatly. Habitat loss due to dredging, construction, lowered water tables and farming is the main problem for this species.

silvery salamander *Ambystoma platineum* – Found in scattered locations from Illinois to Massachusetts, this unusual species consists only of females. In Illinois, it is known from one natural population. A woodland pool is required for breeding, and smallmouth salamander sperm are used to initiate egg development. As many as 80 percent of the developing young die, and in some years the breeding pond dries out before any of the larvae have been able to complete development.

spotted dusky salamander *Desmognathus conanti* – Occurring in only three isolated populations in southern Illinois, this species requires cool spring-fed streams in forests. Found throughout the eastern United States, the spotted dusky salamander is extremely sensitive to deforestation and changes in water quality.

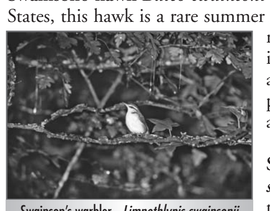
BIRDS

Bewick's wren *Thryomanes bewickii* – Found over a large area of the central, southern and western United States, populations of Bewick's wren are declining throughout the range. Once commonly nesting in central and southern Illinois, today it has only been documented as nesting in less than 10 counties. Competition with house wrens, house sparrows and European starlings as well as habitat loss may be contributing to its decreased numbers.

black rail *Laterallus jamaicensis* – Found along both coasts of the United States, this bird also frequents an area of the Midwest. It is seen occasionally as a rare migrant and summer resident in Illinois. It prefers wet areas with short vegetation including sedges, rushes and grasses. Destruction of marsh habitat in Illinois has been detrimental to this species.

piping plover ***Charadrius melodus*** – Federally endangered. In the United States, the piping plover nests along the Atlantic coast and Great Lakes and inland to the northern Great Plains. In Illinois, it is a rare migrant and rare nesting species along Lake Michigan. In the late 1800s, it nested abundantly along the Illinois shore of Lake Michigan. Recreational and vehicular use of the Lake Michigan shoreline, construction and shoreline erosion have all led to its inability to nest in the state.

Swainson's hawk *Buteo swainsoni* – A bird of the western United States, this hawk is a rare summer resident and rare migrant in the northern part of the state. It lives in open grasslands and nests in an isolated tree. Loss of the prairies and human disturbance are causes of this species' decline.



Swainson's warbler *Limnothlypis swainsonii*
Photo © Rob Curtis, The Early Birder

Swainson's warbler ***Limnothlypis swainsonii*** – Found throughout the southeastern United States, this warbler is restricted to the southern part of Illinois. It relies on large areas of dense forest with an understory of giant cane. If these habitats are not preserved this species will soon be extirpated from the state.

MAMMALS

eastern wood rat *Neotoma floridana* – The eastern wood rat has a few, very small and isolated populations remaining in the state, in southwestern Illinois. Widespread through the eastern and southern United States, Illinois is on the northern border of its range. At one time, the species was abundant in the Shawnee hills in southern Illinois. Extremely severe winter weather has been detrimental to the species.

Indiana bat *Myotis sodalis* – Federally endangered. The Indiana bat occurs from Oklahoma to Michigan and New Hampshire and south to northern Florida. Ninety-seven percent of its total population hibernates in caves in Illinois, Indiana, Kentucky and Missouri. The species has suffered serious declines due to cave vandals, cave commercialism, cave flooding, cave collapse, insecticides and loss of streamside habitat for foraging and rearing young.

Rafinesque's big-eared bat *Corynorhinus rafinesquii* – This species occurs throughout the southeastern one-fourth of the United States, with its range extending into southern Illinois. It is one of the rarest bat species in the state. Little is known of its habits in Illinois, although it has been found roosting in trees, caves and old buildings.

southeastern myotis *Myotis austroriparius* – Illinois is on the northern edge of this species' United States range. Found only in extreme southern Illinois, it has declined in the state due to destruction and alteration of wetland, cave and mine habitats.

INVERTEBRATES

clubshell *Pleurobema clava* – Federally endangered. An inhabitant of medium to large rivers, the clubshell has declined in all of its range. Only found along the eastern border of Illinois, siltation, pollution and channelization have all impacted this species. A plan to restore the clubshell to its native rivers and streams in Illinois is being implemented by the IDNR.

Hine's emerald dragonfly *Somatochlora hineana* – Federally endangered. Hine's emerald dragonfly was believed to be extinct until it was rediscovered in Illinois and Wisconsin in the late 1980s. Known from only a few locations in northeastern Illinois, the insect lives in calcareous spring-fed marshes along the Des Plaines River. Its limited Illinois range is threatened by industrial and highway development.

Illinois cave amphipod *Gammarus acherondytes* – Federally endangered. This small crustacean lives in the underground streams of several cave systems in southwestern Illinois. As these streams are near the surface, they are greatly affected by surface pollutants. Protection of water quality in this species' habitat is critical to its survival.

Iowa Pleistocene snail *Discus macclintocki* – Federally endangered. Found only in Iowa and Illinois, the Iowa Pleistocene snail was first discovered as a living species in 1955. It is restricted to cool algific slopes in northwestern Illinois. Its restricted habitat and human disturbances limit the snail's population growth.

Karner blue butterfly *Lycaeides melissa samuelis* – Federally endangered. The Karner blue butterfly is a native of the Great Lakes and Northeast regions of the United States. Nationwide, populations of the Karner blue have declined by 99 percent. The insect had not been seen for a century in Illinois until 1992, when five were spotted in Lake County. The caterpillar feeds on wild lupine and loss of this plant and its associated habitat have caused the decimation of this butterfly, too.

wavy-rayed lampmussel *Lampsilis fasciola* – Found in northern tributaries of the Ohio River, the wavy-rayed lampmussel is limited in Illinois to the Vermilion River system. It prefers clear, shallow running water with a sand and gravel bottom. Efforts to reduce siltation and other pollutants from agriculture, industry and construction should continue to be implemented.

PLANTS

American mountain ash *Sorbus americana* – Found more commonly in Canada, the northeastern United States and the Appalachian Mountains, American mountain ash grows only in a limited number of locations in northern Illinois. It prefers rocky woods and bogs and has little suitable habitat available.

bristly rose *Rosa acicularis* – Bristly rose grows in northern climates. It is known in Illinois only from two locations in Jo Daviess County on cool algific slopes. One of the sites is protected, and the other is on private land.

Mead's milkweed *Asclepias meadii* – Federally threatened. A plant of mesic prairies, Mead's milkweed was never common in Illinois and became much less abundant with the destruction of the prairies. Very few plants remain in a few scattered locations throughout the state.

moccasin flower *Cypripedium acaule* – Moccasin flower's range extends into Canada and the eastern United States. It is at its southern limit in northern Illinois. Never common in the state, it once grew abundantly in moist forests, forested fens and bogs. It only exists currently at one or two locations in northern Illinois.

screwstem *Bartonia paniculata*
Photo © B.E. Wofford, University of Tennessee

screwstem *Bartonia paniculata* – Screwstem grows in wet peat and sand in the southeastern United States and along the Atlantic coast. It reaches the northern limit of its range in extreme southern Illinois. Three populations are known from the state.

Agency Resources

More information about threatened and endangered species is available from the IDNR. The Illinois Natural History Survey, Illinois State Museum, Division of Wildlife Resources and Division of Natural Heritage study distribution and population levels of these species, maintain research collections, and develop and implement management plans. The Division of Resource Review and Coordination reviews development plans proposed by local and state governments and recommends measures to reduce or avoid adverse impacts to threatened or endangered species and their habitats. The IDNR Division of Education provides Illinois-specific educational materials for teachers, including the *Biodiversity of Illinois* CD-ROM series. A complete list of items available can be accessed at http://dnr.state.il.us/lands/education/CLASSRM/edmats02.htm.

Illinois Department of Natural Resources

Division of Education
One Natural Resources Way
Springfield, IL 62702
217-524-4126
dnr.teachkids@illinois.gov
http://dnr.state.il.us/lands/education

Division of Resource Review and Coordination
One Natural Resources Way
Springfield, IL 62702
217-785-5500
http://dnr.state.il.us/orep/nrrc/nrrc.htm

Illinois Natural History Survey
1816 South Oak Street
Champaign, IL 61820
217-333-6880
http://www.inhs.uiuc.edu/

Division of Natural Heritage
One Natural Resources Way
Springfield, IL 62702
217-785-8774
http://dnr.state.il.us/offices/resource.htm

Division of Wildlife Resources
One Natural Resources Way
Springfield, IL 62702
217-782-6384
http://dnr.state.il.us/orc/wildliferesources/

Illinois State Museum
502 South Spring Street
Springfield, IL 62706
217-782-0061
http://www.museum.state.il.us

Printed by the authority of the State of Illinois PRT XXXXXXX - 10M - 5/07 IS GRAPHICS 2007

What Is A Habitat?

A habitat is the place in which a species is suited to live. There are four important components of a habitat: food; water; shelter or cover; and space. Habitat components must also be in the proper quantities and arrangement. The amount of suitable habitat available generally determines the diversity of species and the number of individuals that can live in an area.

Food: In order to survive, animals must have energy provided by an outside source. The energy comes from the food they eat. Food for animals may be other animals, plants and/or other organisms. Insufficient food in an area limits the number of wildlife species and individuals present. A variety of food sources can increase the types of species utilizing the area. Plants produce their own food (via photosynthesis), but conditions must be favorable for them to thrive.

Water: All organisms must have water, whether from a pond, stream, lake or other habitat, their food or dew. Some species require water at various times in their life cycle. For example, amphibians need water for their developing eggs and young.

Shelter: Protected spaces function to offer escape from predators and extreme weather. Vegetation, tree cavities, brush piles, rock piles and burrows all provide shelter.

Space: Space is the area needed to obtain food, water and shelter in the proper arrangement for an individual, family or social group. Some species require a large amount of space, while others can meet their needs in a smaller area. By enhancing the habitat, the amount of space needed may be reduced.

Habitat requirements may be similar, but they are unique for each species. For example, insects, birds, mammals, fungi, spiders and other species, including plants, may live on or in a tree. Each species performs a different function, though, and has different needs. Within a small area, this web of life acts to support the entire system. Habitats are continually changing in nature, and a healthy ecosystem with many species is more likely to adapt to and survive changes than a system with just a few types of organisms.

Habitats Are Homes

The land where we live, raise crops and livestock, work and travel is also land that originally supported only wildlife. Human activities directly and indirectly affect the wildlife species that an area can support. Often these activities reduce the number of types of species that can live in a place, decreasing its native biodiversity. Habitat destruction and alteration are the most serious problems facing wildlife species.

Biodiversity is the variety of life. It includes species, genetic and ecosystem diversity. The more diversity an area can support, the healthier that environment is considered to be. For example, if a forest includes 50 species of trees, 20 species of birds, 10 species of mammals and five species of amphibians, it would be considered to be more stable and better able to support itself than if a forest of the same size included five species of trees, three species of birds, two species of mammals and two species of amphibians. Besides providing more food options, a healthy environment is better able to withstand change. If something happens to one species, another one may be able to take over some of its functions in the environment. If only a few species are present, the effects of the loss of one of them can be greatly magnified. In some situations where just a few species are present, these species may be invasive exotics that have displaced native species and add little to the health of an ecosystem.

There is a limit to how many individuals and species a habitat can support at any one time. Known as carrying capacity, the limit is determined by the quality and quantity of habitat available. By changing any of the available food, water, shelter and space, or their arrangement, the carrying capacity is affected. If the carrying capacity is decreased, some individuals must leave or die. If the carrying capacity is enhanced, new individuals can move into the area. Carrying capacity changes naturally. It also changes by human influences.

The habitat requirement that is in least supply for a species is the limiting factor. This factor controls population size. For example, if you want to attract eastern bluebirds to a yard or school grounds, you can develop a habitat to attract insects for them to eat and provide the birds with a constant water supply, but if there are no dead trees or other cavities for them to nest in, they will not stay. The availability of nesting habitat is the limiting factor.

Limiting factors are very important in wildlife management. When developing or enhancing habitat, you should consider all factors that are important to the species you want to attract. Also consider that the composition of habitats changes over time. With these changes come natural shifts in the species supported. To retain the species currently occupying a habitat, the vegetation may need to be managed to remain the same in composition and quality.

In Illinois, soils, topography, drainage and climate determine the types of natural communities present in an area. There are four main types of habitats: aquatic; woodland; grassland/prairie; and urban. Each of these habitats has its own characteristics and supports species adapted to them.

Schoolyard Habitat Action Grant

The Illinois Department of Natural Resources' Division of Education offers the *Schoolyard Habitat Action Grant* program for schools and youth organizations that want to develop or enhance existing wildlife habitat areas. Up to $600 per applicant may be obtained through this competitive grant program. The application deadline each year is November 30. Successful applicants will receive funds no later than February 1 and have until the next November 30 to complete the project and submit their report.

Examples of projects developed through the *Schoolyard Habitat Action Grant* program include butterfly gardens, prairie plots, wetlands, outdoor classrooms, feeding stations and nest boxes. Each winning applicant receives a metal sign to post in the habitat area and supplemental literature to assist with the planning and development of the site. *Schoolyard Habitat Development* workshops are also regularly offered through the Division of Education's ENTICE (Environment and Nature Training Institute for Conservation Education) teacher-training program.

The *Schoolyard Habitat Action Grant* program is funded by donations from the Jadel Family Foundation and other private donors. An application form is available online at *http://dnr.state.il.us/lands/education/CLASSRM/grants.htm*.

Helping Habitats

Human actions are often detrimental to wildlife habitat, but humans can also have a beneficial influence on habitats. There are many reasons to become involved in wildlife habitat development or restoration projects, including the direct benefits to native organisms. Increasing the diversity of an area increases its ecological stability. A diverse natural habitat may help homeowners and businesses reduce heating and cooling costs. The beauty of a natural habitat can enhance property values. Undertaking a habitat improvement project can give you and your students a connection to the land and the knowledge that you are doing something to help our world. Today's students are the future stewards of the earth. It is important for them to make that connection.

What Can You Do?

- Use native plants in your yard, school grounds or park. Native plants are naturally adapted to provide food and shelter to native Illinois wildlife. They are also better able to withstand cold, drought, disease and insects than non-native species and cost less to maintain.
- Plant a variety of tree and shrub species in clumps around open spaces to attract many types of wildlife. Select species that flower or fruit at different times of the year to provide food for several months. Leave fruits and vegetation in the habitat over the winter as important food and cover sources.
- Provide nest and den boxes for animal species. Leave dead trees (snags) standing, when possible, to provide food, shelter and roosting locations.
- Use curved or irregular borders and layers of vegetation (instead of plants all the same height) to attract more wildlife species.
- Before clearing an area of vegetation, consider the affect of your actions on the wildlife living there. Is it necessary to remove all of the vegetation? Can you replace some of it in a nearby location?
- Even simple acts like making fresh, clean water available daily can dramatically assist wildlife species.
- Provide brush and rock piles for shelter.
- Research the food and shelter requirements of species you are trying to assist and provide those requirements.
- Encourage the use of retaining edges for wildlife on farm land.
- Write a letter to your elected representatives with your concerns about conservation of our natural resources. Protecting them may entail passage of laws. Your representatives should know how you feel.
- Contribute to organizations that help to preserve habitat, such as the Illinois Wildlife Preservation Fund. Donations to this fund are accepted through the Illinois Department of Natural Resources or by using the check-off box when submitting your state income tax. Purchasing hunting and fishing licenses and habitat stamps also contributes to species protection.
- Volunteer to help with conservation projects in your area.

Illinois Wildlife Preservation Fund

How Do Habitats Change?

Habitats can change very rapidly, particularly if they are being affected by humans or severe natural events, like volcanic eruptions or fire. However, habitat changes are often subtle, occurring over a period of time. In these situations, species declines are indirectly caused.

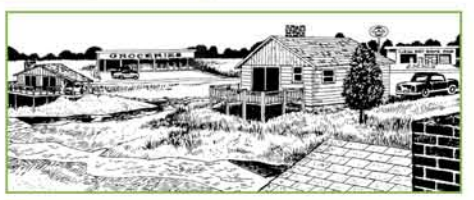
The series of illustrations below depict the evolution of a wetland into dry land. See how many changes you can find between each successive drawing.

An undisturbed wetland may be teeming with organisms and have clear water in both shallow and deep areas.

Land use changes, such as new roads or conversion of uplands to agricultural fields, may increase runoff into the wetland, gradually altering both the water chemistry and the amount of silt entering the wetland.

Additional conversion of nearby land to new uses increases change in the habitat by reducing the buffer for the wetland. Homes and commercial areas may be placed closer to the wetland. Those animals that are unable to adapt to human disturbance may be unsuccessful in raising their young. The plant composition of the wetland gradually changes as species intolerant to the new conditions die out and are replaced by other species, including some not native to Illinois.

Increased demand for land brings developed areas ever closer to the wetland. The diversity of species decreases. As runoff increases, the wetland gradually fills in with dirt, and there are no longer deep water areas.



The wetland is now so surrounded by an altered landscape that it cannot survive. Even though it has not been drained, plowed or paved, it has been destroyed. It can no longer support the variety of life that it once did.

Agency Resources

A good variety of information regarding habitat development and/or enhancement projects can be found on the Illinois Department of Natural Resources' (IDNR) Web site at *http://dnr.state.il.us*. By utilizing the online order form (*http://dnr.state.il.us/lands/education/ CLASSRM/edmats02.htm*) you can select from hundreds of IDNR publications. Many of these items are also available for download. Several grants dedicated to wildlife habitat improvement are offered through the IDNR. See the "For More Information" section of this poster. The IDNR Divisions of Wildlife Resources and Natural Heritage study distribution and population levels of species and develop and implement management plans. The IDNR Division of Resource Review and Coordination reviews development plans proposed by local and state governments and recommends measures to reduce or avoid adverse impacts to species and their habitats. The IDNR Division of Education provides Illinois-specific educational materials for teachers, including the *Biodiversity of Illinois* CD-ROM series.

Illinois Department of Natural Resources

Division of Education
One Natural Resources Way
Springfield, IL 62702
217-524-4126
dnr.teachkids@illinois.gov
http://dnr.state.il.us/lands/education

Division of Resource Review and Coordination
One Natural Resources Way
Springfield, IL 62702
217-785-5500
http://dnr.state.il.us/orep/nrrc/nrrc.htm

Division of Natural Heritage
One Natural Resources Way
Springfield, IL 62702
217-785-8774
http://dnr.state.il.us/offices/resource.htm

Division of Wildlife Resources
One Natural Resources Way
Springfield, IL 62702
217-782-6384
http://dnr.state.il.us/orc/wildliferesources/

Printed by the authority of the State of Illinois. Printed on recycled and recyclable paper stock PRT 3425457 - 10M - 6/07 • IISG07-974

For More Information

Grants

Visit *http://dnr.state.il.us/grants/* for the latest grant information from the Illinois Department of Natural Resources.

Conservation 2000
Schoolyard Habitat Action Grant
Illinois Conservation Foundation
Illinois Wildlife Preservation Fund
Special Wildlife Funds Grant Program

Publications

Butterfly Gardens: This brochure provides basic guidance on developing a butterfly garden, including the plant species preferred by many native butterflies.

Landscaping for Wildlife: An informational booklet about developing wildlife habitat in the home landscape, it is particularly useful for those people interested in attracting birds.

Prairie Establishment and Landscaping: More than just a primer on developing a prairie, this publication offers a history of the prairies in Illinois, too. Sources for native prairie plants are also listed.

Wood Projects for Illinois Wildlife: Plans for feeders and nest boxes are included in this booklet.

Order these publications online at *http://dnr.state.il.us/lands/education/CLASSRM/edmats02.htm*.

Workshops

ENTICE (Environment and Nature Training Institute for Conservation Education): Sponsored by the IDNR Division of Education, *Schoolyard Habitat Development* workshops through the ENTICE teacher-training program offer information, experience and resources for designing and implementing schoolyard habitat sites. Continuing Professional Development Units are available for teachers. Visit *http://www.ilef.org/Workshop/Courses.asp* for the latest ENTICE workshop schedule.

Illinois ENTICE

Illinois

Habitats are Homes

PRAIRIE

reptiles

fishes

reptiles

birds

amphibians

URBAN

reptiles

invertebrates

birds

mammals

invertebrates

mammals

invertebrates

AQUATIC

birds

mammals

birds

mammals

mammals

fishes

WOODLAND

invertebrates

A habitat is the place in which a species is suited to live. There are four important components of a habitat: food; water; shelter or cover; and space. Habitat components must also be in the proper quantities and arrangement. The amount of suitable habitat available generally determines the diversity of species and the number of individuals that can live in an area. Habitat requirements may be similar, but they are unique for each species. Habitat destruction and alteration are the most serious problems facing wildlife species today. Human actions are often detrimental to wildlife habitat, but humans can also have a beneficial influence on habitats. There are many reasons to become involved in wildlife habitat development or restoration projects, including the direct benefits to native organisms. A diverse natural habitat may also help homeowners and businesses reduce heating and cooling costs. The beauty of a natural habitat can enhance property values. Undertaking a habitat improvement project can give you and your students a connection to the land and the knowledge that you are doing something to help our world. Today's students are the future stewards of the earth. It is important for them to make that connection.

Species List

tiger swallowtail	*Papilio glaucus*
six-lined racerunner	*Cnemidophorus sexlineatus*
praying mantis	Family Mantidae
regal fritillary	*Speyeria idalia*
northern bobwhite	*Colinus virginianus*
eastern cottontail	*Sylvilagus floridanus*
cottonmouth	*Agkistrodon piscivorus*
greenside darter	*Etheostoma blennioides*
eastern pondhawk	*Erythemis simplicicollis*
great blue heron	*Ardea herodias*
bullfrog	*Rana catesbeiana*
muskrat	*Ondatra zibethicus*
red shiner	*Cyprinella lutrensis*
eastern box turtle	*Terrapene carolina*
Fowler's toad	*Bufo fowleri*
gray fox	*Urocyon cinereoargenteus*
wild turkey	*Meleagris gallopavo*
white-tailed deer	*Odocoileus virginianus*
American robin (shown in the top two boxes)	*Turdus migratorius*
raccoon	*Procyon lotor*
hoary bat	*Lasiurus cinereus*
spider	Class Arachnida

Photo Credits

© William N. Roston
greenside darter
red shiner

© Russell Verbofsky/ Painet Inc.
muskrat

© Steven Wayne Rotsch/ Painet Inc.
gray fox

© Adele Hodde
Office of Public Services
Illinois Department of Natural Resources
All Other Photographs

This poster was made possible by:

Illinois Department of Natural Resources
Division of Education
Division of Natural Heritage

Illinois Wildlife Preservation Fund

Funding for this project was made possible in part by contributions to the Illinois Wildlife Preservation Fund.