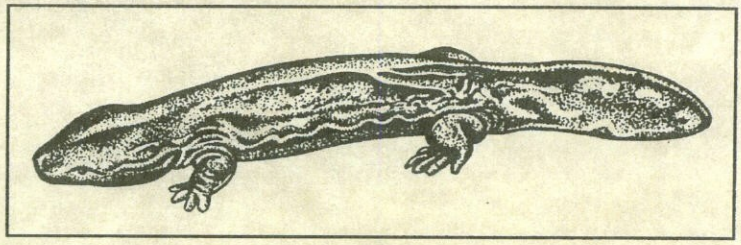
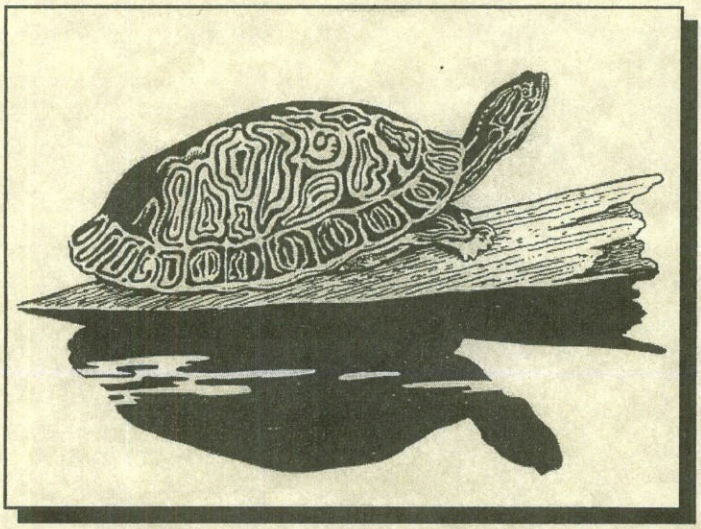
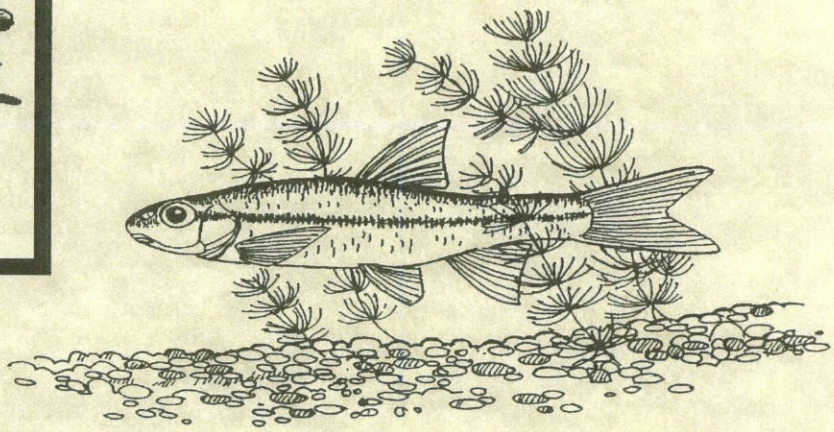
State of Illinois
Rod R. Blagojevich, Governor

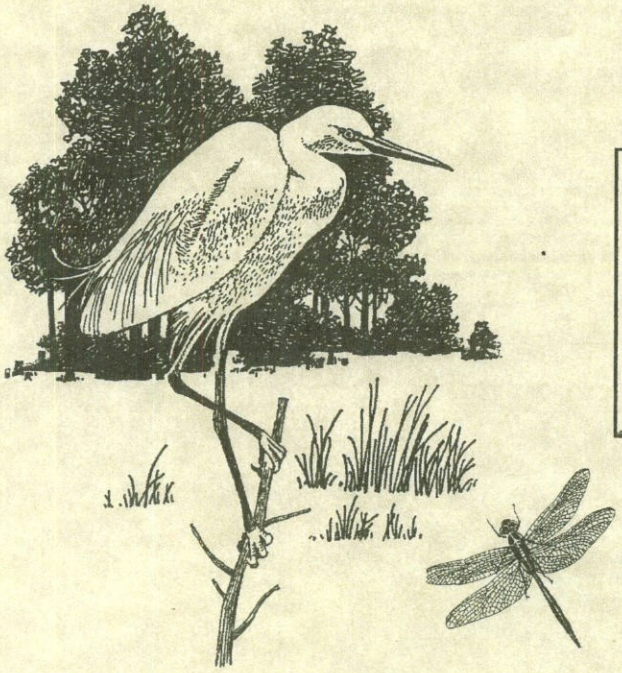
Illinois Department of Natural Resources

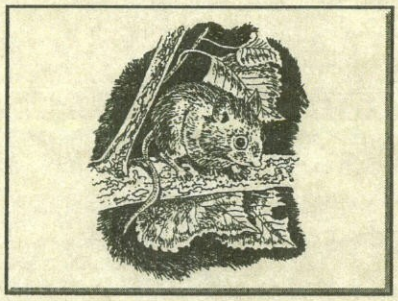


Endangered and Threatened Species of Illinois: Status and Distribution









Volume 2 - Animals

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ENDANGERED AND THREATENED SPECIES OF ILLINOIS: STATUS AND DISTRIBUTION

VOLUME 2: ANIMALS

Randy W. Nÿboer, James R. Herkert, and John E. Ebinger,
Editors

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PROTECTION BOARD

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PREFACE

In 1981 the Illinois Endangered Species Protection Board published the first listing of the status and distribution of endangered and threatened plants and animals in Illinois (Sheviak and Thom 1981). This original listing was the culmination of a major effort entitled the Endangered Species Project. The Endangered Species Project was a comprehensive effort to determine the status of our native species through literature reviews, museum searches, personal contacts, and workshops. The status information compiled during this project served as the basis for the first official state lists of the endangered and threatened species, and was adopted by the Illinois Endangered Species Protection Board. This publication served as the most readily available source of information on endangered and threatened species in Illinois for a decade.

Since the original status and distribution book by Sheviak and Thom (1981) considerable information has been accumulated on our native species. As a result, a major revision of the official state list of endangered and threatened species was completed in 1989. This revision resulted in the Illinois Endangered Species Board publishing two updated volumes of the original status and distribution book, one volume on the endangered and threatened plants of Illinois (Herkert 1991), another listing the endangered and threatened animals of Illinois (Herkert 1992).

In January of 1994 the second major revision of the official state list of endangered and threatened species was completed. As a result of this revision a total of 511 species were officially recognized as endangered and threatened in Illinois. Herkert (1994) summarized the changes that were made to the Illinois list during this list review and revision and provided status and distribution data for the species that were added to the official state list in 1994.

Since the days of the first Endangered Species Project, the process of determining species to be listed as endangered or threatened in Illinois has become increasing complex. Listing revisions now are completed every five years, and these listing decisions must be based on scientific evidence. As a result, the list was reviewed and revised in 1999. As a result of that listing process the status and distribution of the endangered and threatened plant species of Illinois was completed (Herkert and Ebinger 2002). The status and distribution of the endangered and threatened animal of Illinois was not undertaken as there were relatively few changes in the list. This present volume is the result of the listing process that was completed in 2004. It contains that status and distribution of all of the changes made in the animal list during the listing process. Nÿboer and Ebinger (2004) recently completed a list of all changes in the status of endangered and threatened plant species of Illinois.

While the listing process has changed over time, the interest of the people of Illinois in endangered species has not diminished. These volumes continue to be among the most popular among people seeking information on the status and distribution of Illinois' native species. The Illinois Endangered Species Protection Board appreciates this interest and support.

Randy W. Nÿboer
Program Manager
Illinois Endangered Species Protection Board

TABLE OF CONTENTS

Appendices

INTRODUCTION

At the time of European settlement about 61% of Illinois was covered with prairie with most of the remainder in forest. The most extensive prairies were found in the flat to gently rolling topography of the prairie peninsula that covered the northeastern quarter of the state. Throughout the prairie peninsula forests were mostly encountered along the major rivers and stream, or as isolated groves. Woodlands, savanna, and forests were more common throughout the remainder of the state particularly in areas of more rugged topography. The pre-settlement distribution of the major vegetation types (prairie, savanna, open woodland, and forest) was determined largely by firebreaks, such as lakes and rivers, and by topographic relief that controlled the frequency and intensity of fires.

Though appearing pristine to the casual observer the vegetation on the Midwest at the time of European settlement had been already been subjected to both human and natural disturbances. Native Americans had been living here for more than 11,000 years. When they arrived they almost immediately began altering their environment, exploiting plants, animals, and mineral resources. Their use of these natural resources caused the extinction of some plants and animals, the introduction of new species, and the extensive modification of the composition and structure of the forests and prairies. The most profound effect on environment by native Americans was their use of fire. Landscape fires, that burned for days and covered extensive areas, were common. These large, intense fires shaped the prairie/forest borders as well as the composition and structure of the vegetation and the animals that relied on this vegetation for food and cover.

When European man entered Illinois the broad expanses of prairie and forests were still intact, and, though modified by fire, still retained the high diversity of plants and animals species characteristic of these communities. In the course of settling Illinois the early pioneers made extensive alterations to this landscape. Much of the savannas and forests were cut, the prairie plowed, swamps and marshes drained, and many of the animals hunted to near extinction. These alterations are continuing to this day. We watch as the last natural remnants of our landscape are threatened on all sides with the ever-increasing demands of our society for more space and raw materials.

It is now apparent that the once diverse and abundant wild life around us is diminishing. Many of our native species have been brought to the brink of extinction, certainly from localized areas, and sometimes on a much broader scale. Loss of habitat, fragmentation of communities, the lack of fire, the introduction of exotic species, and pollution, are some of the reasons for this reduction in diversity, but it is mostly the loss of "living space." Species of animals and plants do not just live anywhere; they have specific habitat requirements. By degrading and modifying the environment humans have reduced the "living space" for many other species. We now find that we risk losing many of our native species from the wild in Illinois.

In 1972, the Illinois Endangered Species Protection Act was passed in an effort to halt the loss of species from Illinois. Unfortunately, the original version of that Act protected only animal species, and initially only species such as leopards, tigers, alligators, cheetahs, polar bears and jaguars. The first list of endangered and threatened animals in Illinois was developed during 1976-1979 and officially adopted under the Endangered Species Protection Act in 1980. No revision of this list had yet taken place, when the 1985 amendments to the Act stated that all listing decisions must be based on scientific evidence, requiring more than the consensus of experts, which was utilized in developing the original list. The Illinois Endangered Species Protection Board, responsible under the Act for determining which species are endangered or threatened in the state, began a review and revision of the animal list in 1987. The Board is now required by law to review and revise the entire state list of endangered and threatened animal and plant species at least every five years. During our five year reviews, we evaluate species already on the list, and also those species that are not listed but for which monitoring data indicates some reason for concern.

Listing decisions are made only following review and analysis of established scientific databases and published scientific articles though anecdotal reports and sighting records are also investigated. These data are reviewed by the

Board, and also by six different Endangered Species Technical Advisory Committees (ESTAC's) made up of scientists from throughout the state with expertise in the various species groups. Information considered for each species includes its range in the state (including changes in its occupied range), abundance in Illinois (total numbers), number of known populations or locations where it occurs, number of these locations which are known to be protected from disturbance, population trends (changes in total numbers or numbers of populations over time), the type of threats the species faces, and how fragile or sensitive it is (species biology). It is important to note that decisions to list or delist a species are not strictly based on a numerical formula, but rather takes into account the individual requirements of different species. In some circumstances, species which are low in number, but have always been rare or uncommon in the state, may in fact not qualify as endangered or threatened if their numbers are stable or they are under no specific threat.

The Board, its staff, and technical advisors (ESTAC's) reviewed the status of hundreds of animal and plant species during this latest list revision. We ultimately approved changes (including species added to the list, species removed from the list, species upgraded from threatened to endangered, species downgraded from endangered to threatened) involving more than one hundred species of animals and plants.

The animals discussed in this book reflect the official State List of endangered and threatened as of the last revision in April 2004. Today there are 144 species of animals listed as endangered (93 species) or threatened (51 species) under the Illinois Endangered Species Act. For many of these species we still lack the information needed to determine how to save them. For others we simply lack the ability to halt the continued destruction of the native communities of which they are a part. Whatever the circumstances, our goal for each is the same; to one day be able to remove all species from the list as endangered or threatened because their populations are recovered and once again secure.

Randy W. Nyboer
James R. Herkert
John E. Ebinger

ACKNOWLEDGMENTS

We could not have produced this work without the effort given by those who produced the original book and the subsequent revisions. We owe a debt of thanks to everyone involved in these earlier publications; their efforts and dedication to endangered and threatened species are an inspiration to all of us.

The Illinois Endangered Species Protection Board and the present editors are indebted to those who assistant in the listing process and in the preparation of this volume. Valuable assistance was given by the personnel of the Illinois Department of Natural Resource's Natural Heritage Database in providing updated information on species occurrences. Also, the efforts of the field staff of the Illinois Department of Natural Resources, and the field staff of the Illinois Nature Preserves Commission are greatly appreciated. Their work has contributed to the status and distribution data included in this volume and their on-going work in the field has provided the foundation of Illinois' endangered species restoration and management efforts.

Many zoologists and biologists, both professionals and amateurs, have contributed to the completion of this volume. Their field efforts have been very helpful in understanding the distribution and status of the animal species listed. Without their effort the resulted presented here could not have been accomplished. The efforts of the many early Illinois Zoologists, whose collections still exist, have been useful in determining the past distribution of the animal species listed. We appreciate these early efforts, for without their efforts it would be hard to understand the present, or prepare for the future.

The work of the many professional scientists at the Illinois Natural History Survey, Champaign, Illinois, is greatly appreciated. These dedicated professionals have spent many hours in the field studying many of the listed species. Their extensive knowledge and observations has been extremely helpful in our present understanding of these species. Also, the extensive collections and the library holdings of the Illinois Natural History Survey have been valuable sources of information concerning many of the listed animal species.

The Illinois Endangered Species Protection Board would also like to thank the members of the Endangered Species Technical Advisory Committees (ESTACs) on the various animals groups. The ESTAC members have been extremely helpful in the listing process. These committees provided valuable advice on a variety of matters, and undertook the difficult task of reviewing the animal records from the past decade in order to formulate recommendations to the Board regarding the species in need of protection. Though the final listing decisions are the Boards, the evaluation of the numerous species reviewed and the recommendations of the ESTAC members made the Boards' job easier. The Illinois Endangered Species protection Board would like to thank the members of the ESTACs for their help in making the decisions included in the present list. These dedicated individuals are listed below.

Randy W. Nÿboer
Program Manager
Illinois Endangered Species Protection Board

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Dr. Joyce Hofmann

SPECIAL THANKS

Determining what species to list as endangered or threatened involved many individuals who devote a great deal of time and energy in trying to make the correct listing decisions. This involved field studies, literature searches, collection searches, and contacting individuals that had information concerning particular species. Many individuals have been involved, both amateur and professional, from all parts of Illinois and surrounding states. The efforts of these individuals are greatly appreciate by the Illinois Endangered Species Protection Board, and we thank them for their time and suggestions. A few individuals were especially helpful in the listing process. They help with editing the preliminary versions, determined the validity of many of the site records, and provided advice to the editors on the many decisions that had to be made. We appreciate their help, without their efforts our job would have been much more difficult.

Robert (Bob) D. Bluett is a certified Wildlife Biologist employed by the Illinois Department of Natural Resources (IDNR). He earned a B.A. in biology from Ripon College and a M.S. in wildlife management from the University of Wisconsin-Stevens Point. Bob coordinated development and implementation of Illinois' river otter recovery plan. He is currently working with the USDA Forest Service, Southern Illinois University, Illinois Endangered Species Protection Board, and IDNR's Division of Resource Protection and Stewardship to improve the status of the eastern woodrat.

John K. Bouseman is recently retired as an Associate Professional Scientist at the Illinois Natural History Survey. A native of Savanna, Illinois, he received his B.S. and M.S. degrees in entomology from the University of Illinois, Urbana-Champaign. His research interest is in the systematics and ecology of bees, beetles, and butterflies. He has participated in expeditions in North America, South America, West Indies, Europe, Africa, and Asia.

Kevin S. Cummings is a lifelong resident of Illinois. Born and raised near Chicago (Bears and White Sox fan and aficionado of Chicago Blues), he obtained B.S. and M.A. degrees in zoology from Southern Illinois University at Carbondale. Kevin has been employed as a research scientist and Curator of Mollusks at the Illinois Natural History Survey in Champaign since 1983. His research interests are in the areas of conservation, systematics, and ecology of freshwater mollusks and the protection of freshwater habitats; primarily streams. He is the co-author (with Christine Mayer), of a Field Guide to Freshwater Mussels of the Midwest (1992).

R. Edward DeWalt is an aquatic entomologist with the Illinois Natural History Survey in Champaign. He earned a Ph.D. in aquatic entomology from the University of North Texas in 1992. His passion is the taxonomy, life history, and conservation of stoneflies (Plecoptera), but also has developed expertise in mayfly (Ephemeroptera) and caddisfly (Trichoptera) taxonomy and ecology. He uses these three insect orders to monitor stream conditions throughout Illinois for the Critical Trend Assessment Program. A primary interest of his is the comparison of historical and contemporary aquatic insect faunas and in using museum specimens to track losses of insect species in Illinois and the Midwest.

Chris Dietrich is an insect systematist and curator in the Center for Biodiversity, Illinois Natural History Survey. He earned a B.S. in biology at the University of Pittsburgh, and a Ph.D. in entomology at North Carolina State University. His research focuses on the systematics, evolution, and conservation of leafhoppers, treehoppers, and their relatives (Hemiptera).

Michael Dreslik is currently pursuing his doctoral degree in the Department of Natural Resources and Environmental Science at the University of Illinois, Urbana-Champaign, and holds a graduate research assistantship with the Illinois Natural History Survey. Michael's primary research interests are ecology and conservation of herpetofauna. He received his M.S. degree at Eastern Illinois University, Charleston, where he began and is continuing a long-term ecological study of the state endangered River Cooter (*Pseudemys concinna*). Presently, he is part of a team studying the life history and ecology of the Eastern Massasauga (*Sistrurus catenatus*) with his doctoral research emphasizing population, spatial, and thermal ecology.

Joyce E. Hofmann is a Research Scientist at the Illinois Natural History Survey in Champaign. Joyce attended the University of Illinois at Chicago as an undergraduate and received M.S. and Ph.D. degrees in zoology from the University of Illinois, Urbana-Champaign. She has conducted ecological and behavioral research on rodents and bats. Since joining the Natural History Survey in 1985, her focus has been the distribution and natural history of Illinois mammals, and she conducts surveys for endangered and threatened species throughout the state. She also is a curator of the Illinois Natural History Survey and University of Illinois Museum of Natural History mammal collections.

Joseph A. Kath serves as the Endangered Species Project Manager within the Illinois Department of Natural Resources (IDNR). He received his B.S. and M.S. degrees in environmental biology from the University of Illinois, Urbana-Champaign. His primary job responsibilities include the development and implementation of endangered and threatened species management and recovery plans and the issuance of endangered species possession and research permits. Joe coordinates much of the IDNR's bat related field studies, serves as the chairman for the Northeast Bat Workshop Group, is an executive steering committee member of the North American Bat Conservation Partnership, and is a steering committee member of the U.S. Geological Survey's Monitoring Trends in U.S. Bat Populations project.

Christopher (Chris) A. Phillips is an Assistant Professional Scientist in the Center for Biodiversity, Illinois Natural History Survey, Champaign. He received his Ph.D. from Washington University, St. Louis in 1989, and his B.S. from Eastern Illinois University, Charleston in 1983. His current interests are in the field of ecology and population genetics. Current questions focus on North American amphibians and reptiles. He is especially interested in population structure of wide ranging species and population viability. Chris is a member of the Illinois Endangered Species Protection Board.

Mike Retzer was born in Peoria and is presently on the staff of the Illinois Natural History Survey, Champaign. He attended Bradley University in Peoria, Southern Illinois University in Carbondale, and obtained his Ph.D. at the University of Illinois, Urbana-Champaign. Mike is an ichthyologist with interests in the conservation of Illinois fishes and is studying the taxonomy of African catfishes.

James G. Sternburg is Professor Emeritus of Entomology at the University of Illinois, Urbana-Champaign, and an affiliate of the Illinois Natural History Survey, Champaign. He received his Ph.D. in 1952 from the University of Illinois. For the past 30 years he has conducted research on insects and has photographed insects in nature in Illinois and adjacent state. Professor Sternburg is originally from Chicago and Glen Ellyn.

Christopher (Chris) A. Taylor is a Research Scientist with the Illinois Natural History Survey in Champaign. He earned his B.S. and M.S. from Southern Illinois University, Carbondale, and his Ph.D. from the University of Illinois, Urbana-Champaign. Chris conducts field surveys for rare fishes and crustaceans in Illinois, and also researches the systematics and conservation of North American crayfishes.

Steven (Steve) J. Taylor is an Associate Research Scientist at the Illinois Natural History Survey (INHS), Champaign. He earned his B.A. in biology from Hendrix College in Arkansas, a M.S. in biology from Texas A&M University, and a Ph.D. in zoology from Southern Illinois University at Carbondale. Steve conducts research on the biology, conservation, and management of cave and karst fauna, on the biology of true bugs (Hemiptera), and studies stream macroinvertebrates as a part of INHS's Statewide Biological Survey and Assessment Program.

Randy W. Nÿboer
James R. Herkert
John E. Ebinger

ABOUT THE EDITORS AND SECRETARY

John E. Ebinger is an Emeritus Professor of Botany at Eastern Illinois University, Charleston, Illinois. He received his Ph. D. from Yale University in 1961 and his undergraduate degree in 1955 from Miami University, Oxford, Ohio. His current research involves the composition and structure of the vegetation of the Illinois sand deposits. John is a current member of the Illinois Endangered Species Protection Board.

James R. Herkert is the Upper Mississippi River Program Director for the Illinois Chapter of The Nature Conservancy. Before joining the Conservancy in 2001, James spent ten years working for the Illinois Endangered Species Protection Board, where he coordinated review and revisions to the state list of endangered and threatened species. He received his Ph.D. from the University of Illinois-Champaign and has both a B.S. and M.S. degree from Illinois State University in Normal. Jim's research interests focus primarily on the conservation and management of grassland birds.

Randy W. Nÿboer is a Research Ecologist for the Illinois Natural History Survey, and is located at the Lost Mound Field Station (Savanna Army Depot) in northwestern Illinois. He worked for 25 years managing natural areas and endangered resources for the Division of Natural Heritage with the Illinois Department of Natural Resources. Prior to this he was a field ecologist with the Illinois Natural Areas Inventory. Randy received his undergraduate degree in Botany in 1974 and a M. S. in Botany in 1975, at Eastern Illinois University. His present work deals with protecting endangered species at the Savanna Army Depot and monitoring endangered and threatened plants in northwestern Illinois. Also, he is Program Manager for the Endangered Species Protection Board.

Janet M. Boyer is the Secretary for the Illinois Endangered Species Protection Board. She has served in this capacity for ten years and has been involved in editing the Illinois list since 1994. Her expertise in handling issues, meetings and other duties of the Board have been exceptionally valued during times of administrative transition. Janet's dedication to the IESPB and to the conservation of those plants and animals listed in Illinois, is unsurpassed and so noted here. Janet received her Bachelor's of Arts in Management from Sangamon State University in 1976.

Summary of Changes to the Illinois Animal List

ADDED AS ENDANGERED

MAMMALS
- *Canis lupus* (gray/timber wolf)*

INVERTEBRATES
- *Fontigens antroecetes* (Hydrobiid cave snail)

ADDED AS THREATENED

FISH
- *Erimystax x-punctatus* (gravel chub)
- *Fundulus dispar* (starhead topminnow)

AMPHIBIANS
- *Gastrophryne carolinensis* (eastern narrowmouth toad)

REPTILES
- *Tropidoclonion lineatum* (lined snake)

BIRDS
- *Dendroica cerulea* (cerulean warbler)

MAMMALS
- *Spermophilus franklinii* (Franklin's ground squirrel)

REMOVED FROM ENDANGERED [1]

FISH
- *Platygobio gracilis* (flathead chub) [2]
- *Pternotropis hubbsi* (bluehead shiner) [2]

INVERTEBRATES
- *Obovaria subrotunda* (round hickorynut) [2]
- *Pleurobema rubrum* (pyramid pigtoe) [2]
- *Villosa fabalis* (rayed bean) [2]
- *Crangonyx antennatus* (Appalachian valley cave amphipod) [4]

* No Board action required, automatically added April 1 2003 based on federal listing by USFWS. That action was recently overturned by a federal court in Oregon. To date, the wolf's status is pending.

REMOVED FROM THREATENED [1]

BIRDS
- *Certhia americana* (brown creeper) [3]
- *Podilymbus podiceps* (pied-billed grebe) [3]
- *Buteo lineatus* (red-shouldered hawk) [3]

MAMMALS
- *Lontra canadensis* (river otter) [5]

INVERTEBRATES
- *Gammarus bousfieldi* (Bousfield's amphipod) [3]

CHANGED STATUS FROM ENDANGERED TO THREATENED

FISH
- *Etheostoma exile* (Iowa darter)

REPTILES
- *Thamnophis sauritus* (eastern ribbonsnake)

BIRDS
- *Ammodramus henslowii* (Henslow's sparrow)
- *Falco peregrinus* (peregrine falcon)

INVERTEBRATES
- *Villosa lienosa* (little spectaclecase).

CHANGED STATUS FROM THREATENED TO ENDANGERED

REPTILES

Elaphe guttata emoryi (great plains ratsnake)

NAME CHANGES

BIRDS

Tyto alba (common barn-owl) to barn owl

AMPHIBIANS

Desmognathus fuscus (dusky salamander) to *D. conanti* (spotted dusky salamander)

REPTILES

Macroclemys temminckii (alligator snapping turtle) to *Macrochelys temminckii*

Elaphe guttata emoryi (great plains ratsnake) to *Elaphe emoryi*

INVERTEBRATES

Orconectes placidus (crayfish) to bigclaw crayfish.

Orconectes lancifer (oxbow crayfish) to shrimp crayfish

[1] Primary reason for delisting Endangered and Threatened Species are designated by superscripts.
[2] All native populations are now considered to be extirpated from Illinois.
[3] Now known to be more common in Illinois than previously thought.
[4] Illinois records for this species were based on misidentified specimens.
[5] Considered as recovered in Illinois as a result of stable native populations and river otter reintroductions.

HOW TO USE THIS BOOK

The purpose of this volume is to provide general information on animal species which are listed as endangered or threatened in Illinois and where they occur in the state. It is not intended to serve as a field guide for species identification, and for that reason no attempt has been made to illustrate each species. It should not be used for precise locational information on where a particular species occurs, as this information is constantly being revised as data are collected, and may be out-of-date for some species at the time of publication. Anyone desiring precise information on endangered or threatened species occurrences in Illinois should contact the Illinois Department of Natural Resources' Natural Heritage Database in Springfield (see additional information on inside of back cover.

KEY

The narrative for each species is accompanied by a map of Illinois with county outlines shown. Counties from which the species in known to occur are shown as a solid circle; county records which may no longer be extant are shown as an open circle. An example of a species treatment is as follows:

ORGANIZATION OF TEXT

Species have been arranged in the text alphabetically by scientific name within taxonomic classes. The Latin name by which the species is officially listed under the Illinois Endangered Species Protection Act is the primary name used in this volume. Species classified as endangered or threatened are intermixed, rather than broken into two groupings; the status of each species is noted in the narrative for that species. Because not all readers will know the scientific name of a species, and since a few species may be known by more than one Latin name, readers can use the **Index** to look up species discussed in this volume. The Index gives both Latin and common names, as well as synonyms, allowing a species to be located in several ways.

Since an alphabetic listing does not place related species next to each other in the text, a **Listing of Endangered and Threatened Animal Species by Class and Family** (Appendix III) is provided, grouping all listed species by family. This will be helpful for those readers wishing to know at a glance whether related species are also listed as endangered or threatened in Illinois.

The **Cross Reference of Species to County** (Appendix IV) can be used to find what counties a particular species occurs in. Conversely, a county can be checked for which species occur there. **CAUTION:** Please remember that new data are being collected all the time. The information in the species/county cross references could be out-of-date for some species by the time this volume is printed. This index, as is true of the entire book should only be used to get a general picture of endangered and threatened animal status in Illinois. It should never be used as a sole source of locational information for any report, project, regional/local planning, or environmental impact assessment. For work of that nature, you **must** contact the Illinois Department of Natural Resources, Division of Habitat Resources, One Natural Resources Way, Springfield, IL 62702-1271.

Genus species (Author)

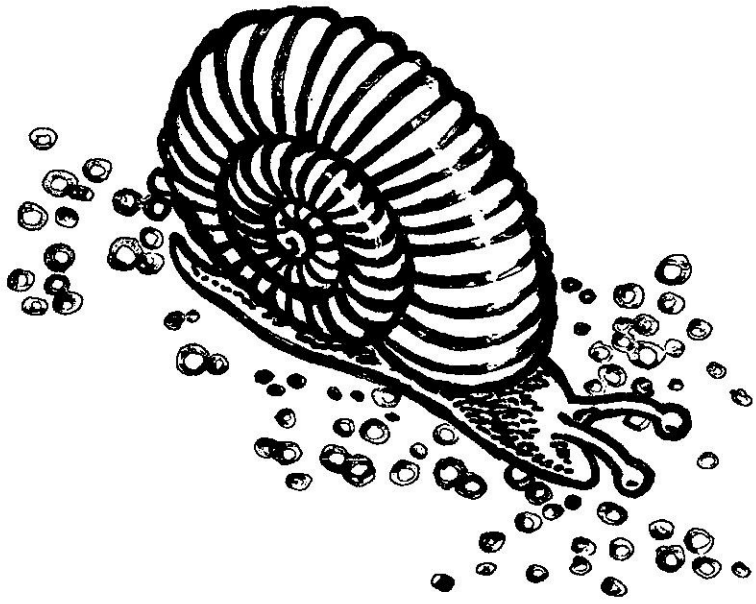
COMMON NAME **FAMILY NAME Status:** Endangered or Threatened in Illinois
Federal Status, if any, is also noted

Present Distribution: A verbal description of the species' general range in North America.
Former Illinois Distribution: A description of the species' former distribution in Illinois.
Habitat: Specific habitat requirements or associations of the species.
Reason for Status: Factors believed to have led to the species' endangered or threatened status in Illinois.
Management Recommendations: Management needs for the recovery and protection of the species.

Discus macclintocki (Baker)

IOWA PLEISTOCENE SNAIL **DISCIDAE** **Status:** Endangered in Illinois
Federally Endangered

Present Distribution: The Iowa Pleistocene snail is known from only 18 locations, all in Iowa and Illinois (Frest 1984).
Former Illinois Distribution: The Iowa Pleistocene snail was first described from a fossil in 1928, and living specimens were not found until 1955 (Frest 1984). The distribution of this glacial relict has probably always been similar to the current distribution, although there are Pleistocene Era records from much of central Illinois.
Habitat: In Illinois, this snail is restricted to algific slope habitats in the Driftless area of the northwestern part of the state.
Reason for Status: Human disturbances such as habitat clearing, pasturing, trampling, and road building are all threats to populations of this species (Frest 1984).
Management Recommendations: The primary management needs for this species are habitat protection, population monitoring, life history research, and research investigating the feasibility of reestablishing snail colonies in other suitable areas.



Discus macclintocki
(Iowa Pleistocene Snail)

Fontigens antroecetes (Hubricht)

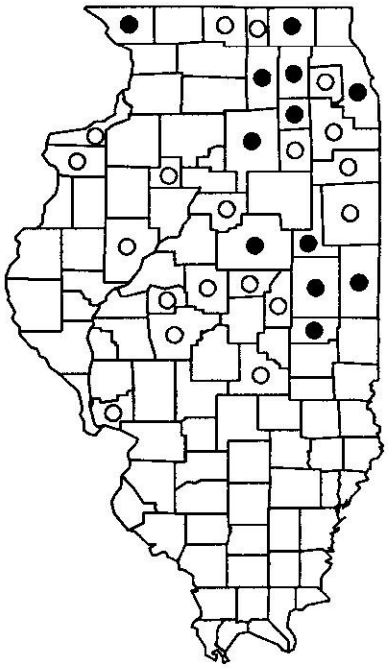
HYDROBIID CAVE SNAIL **HYDROBIIDAE** **Status:** Endangered in Illinois

Present Distribution: The hydrobiid cave snail occurs only in a narrow range comprising a few caves in eastern Missouri and one groundwater basin in St. Clair County, Illinois.
Former Illinois Distribution: *Fontigens antroecetes* probably has never been widespread, being restricted to caves in eastern Missouri and adjacent Illinois (Lewis *et al.* 2003).
Habitat: The hydrobiid cave snail in an obligate cave species.
Reason For Status: The groundwater habitat in all or most of the caves in which this species occurs has been degraded by a variety of factors, notably nutrient enrichment from septic effluent. During recent surveys of caves and springs in Monroe and St. Clair counties in the southern Illinois karst region no addition localities for the hydrobiid cave snail were discovered. Its presence has been confirmed for one cave system in a state nature preserve (Lewis *et al.* 2003).
Management Recommendations: The primary management need for this species is habitat protection. The controlling of nutrient enrichment from septic systems, as well as siltation, nutrients and chemicals from farming operations are imperative for the survival of this species.

MUSSELS (Bivalvia)

Alasmidonta viridis (Rafinesque)

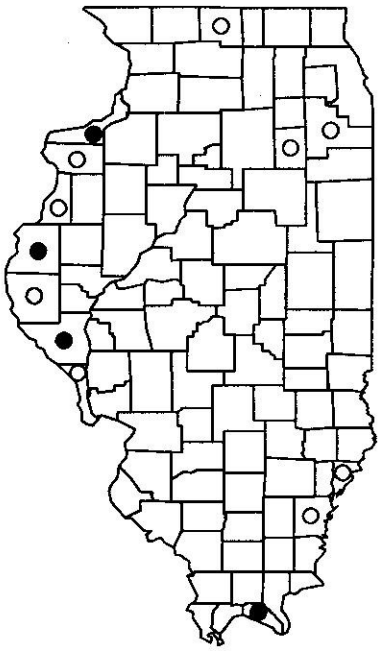
SLIPPERSHELL **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: The slippershell is known from the upper Mississippi, Ohio, Cumberland, and Tennessee river drainages, and lower and middle sections of the St. Lawrence River system (Parmalee 1967). In Illinois, it is known from the Sangamon, Kankakee, Vermilion, Mackinaw, Rock, and Fox river systems (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: Parmalee (1967) reported that this species occurred only in central and northern Illinois where it could be locally common.
Habitat: The slippershell inhabits small to medium sized streams where it is usually found buried in sandy substrates in shallow water (Baker 1928, Parmalee 1967). In Missouri, this species is most frequently found in headwaters of streams where the water is clear and cool (Oesch 1984).
Reason for Status: The slippershell now has a restricted distribution in Illinois, and its numbers have been reduced most likely as a result of increased siltation and channelization in small to medium sized streams throughout the state.
Management recommendations: Better soil conservation measures are needed in order to reduce and preferably reverse declining water quality due to agricultural runoff and pollution. Improved protection from herbicides, pesticides, industrial-related pollution, and dredging in small streams is also needed.

Cumberlandia monodonta (Say)

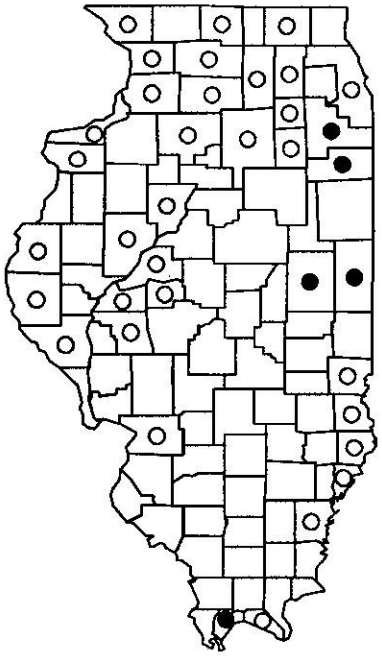
SPECTACLECASE **UNIONIDAE** **Status:** Endangered in Illinois



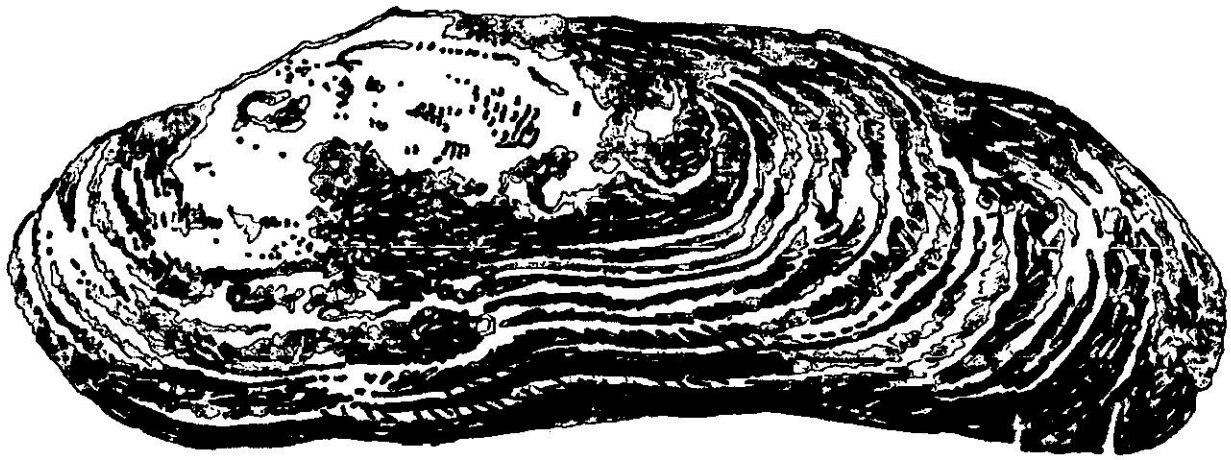
Present Distribution: The spectaclecase has been found in the Ohio, Mississippi, Cumberland, and Tennessee river systems (Parmalee 1967). In Illinois, it is currently restricted to the Mississippi and Ohio river systems (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: This species also occurred in the Illinois, Kankakee, Rock and Wabash rivers, but was extirpated from these river by 1970 (Parmalee 1967, Starrett 1971, K.S. Cummings unpublished data).
Habitat: The spectaclecase is usually found buried deeply in gravel or sand bottoms, in medium to large sized river with fairly good current (Parmalee 1967). In Missouri, this species apparently requires stable bottoms of large rocks or boulders (Oesch 1984).
Reason for Status: Populations of this mussel have declined within Illinois, and it is now restricted to only two rivers in the state. Increased siltation, domestic, industrial, and agricultural pollution, and competition from exotic mussel species are all potential threats to this species in Illinois.
Management recommendations: Populations of this species in the Mississippi River need to be protected from dredging, and sand and gravel mining. Additionally, efforts to reduce siltation and pollution in the Mississippi River would also benefit this species.

Cyclonaias tuberculata (Rafinesque)

PURPLE WARTYBACK **UNIONIDAE** **Status:** Threatened in Illinois



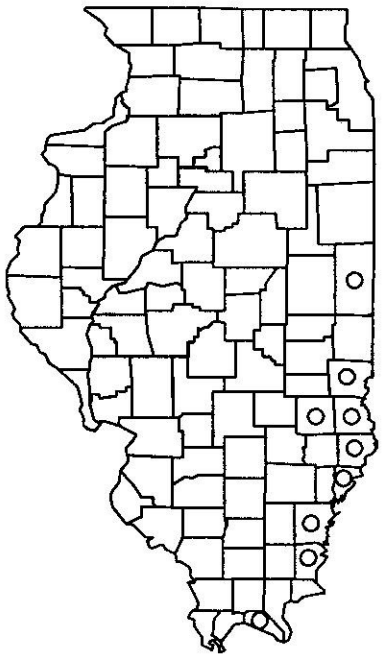
Present Distribution: The purple wartyback is known from the Mississippi River drainage including the Ohio, Cumberland, and Tennessee river systems (Parmalee 1967).
Former Illinois Distribution: This species is fairly widely distributed in Illinois, occurring in 37 counties (INHS Mollusk Collection). It is presently restricted to the Ohio, Kankakee, and Vermilion river drainages in Illinois (Cummings and Mayer 1992).
Habitat: Medium to large rivers in gravel or mixed sand and gravel, or gravel and mud, usually in areas of current (Parmalee 1967, Cummings and Mayer 1992).
Reason for Status: Widespread but uncommon in the Midwest (Cummings and Mayer 1992), this species has experienced a dramatic decline in Illinois, being known from just 8% of the Illinois counties with historic records.
Management recommendations: Management needs for this species include identification and protection of essential habitat, population monitoring and enhanced conservation measures designed to reduce siltation, agricultural runoff, and pollution in water courses in which it occurs.



Cumberlandia monodonta
(Spectaclecase)

Cyprogenia stegaria (Rafinesque)

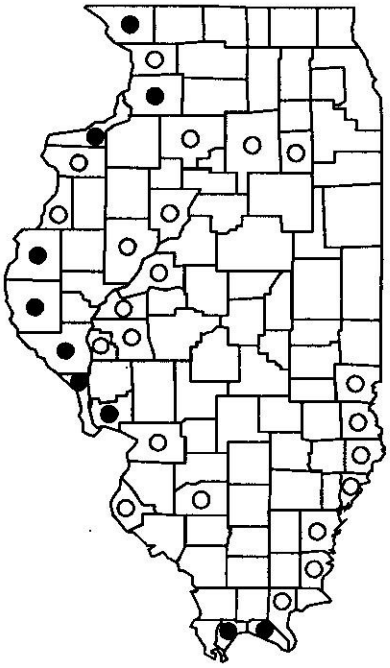
FANSHELL **UNIONIDAE** **Status:** Endangered in Illinois
Federally Endangered



Present Distribution: Presently reproducing populations of the fanshell are known only from three rivers in Kentucky, Tennessee, and Virginia (Federal Register 1990). Additional non-reproducing populations are believed to occur in Ohio, West Virginia, Indiana, Kentucky, Tennessee, and Illinois (Wabash River) (Federal Register 1990).
Former Illinois Distribution: In Illinois, the fanshell is known to have occurred only in the Embarras, Ohio, and Wabash rivers. It was once widespread and common in the Wabash River, and has now been extirpated from the Embarras and Ohio rivers in Illinois.
Habitat: The fanshell occurs in current at depths of a few cm to approximately 1 m over coarse sand and gravel substrates (Parmalee 1967).
Reason for Status: The distribution and reproductive capacity of this species have been greatly diminished due to construction of impoundments and navigation facilities, dredging, sand and gravel mining, and water pollution (Federal Register 1990).
Management Recommendations: Efforts should be made to restrict dredging, impoundments, and navigational improvements in the Wabash River. As is the case for other mussels species, the fanshell would benefit from increased efforts to reduce excessive siltation and domestic, industrial, and agricultural pollution.

Ellipsaria lineolata (Rafinesque)

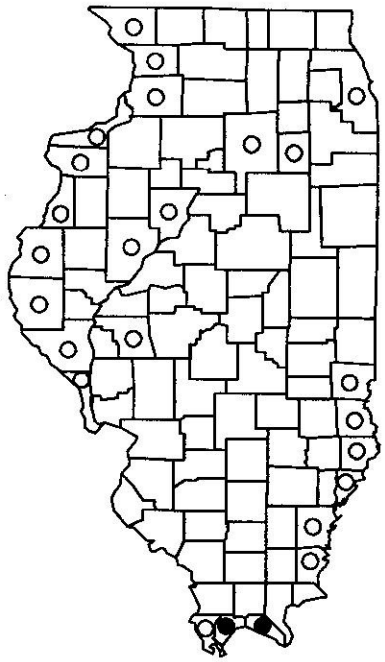
BUTTERFLY **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: This freshwater mussel is known from the Mississippi River drainage from western Pennsylvania to Iowa and Kansas, north to Minnesota, southwest to Oklahoma, and southeast to Alabama (Parmalee 1967).
Former Illinois Distribution: In Illinois, the butterfly mussel has been recorded from the Kaskaskia, Illinois, Rock, Wabash, Ohio and Mississippi rivers (Parmalee 1967, Cummings and Mayer 1992). This species has been extirpated from all Illinois rivers except the Ohio and Mississippi rivers.
Habitat: Large rivers in sand or gravel substrates especially in bars in current at a depth of 1-2 m or more (Parmalee 1967, Cummings and Mayer 1992).
Reason For Status: The butterfly mussel is fairly widespread in the Midwest but only locally abundant and is disappearing from many areas where it formerly occurred (Cummings and Mayer 1992). It is listed as endangered in Ohio and Wisconsin, and threatened in Iowa (Cummings and Mayer 1992).
Management Recommendations: Better soil conservation measures are needed in order to reduce, and preferably improve, declining water quality due to agricultural runoff and pollution. Increased protection from herbicides, pesticides and industrial related pollution is also needed.

Elliptio crassidens (Lamarck)

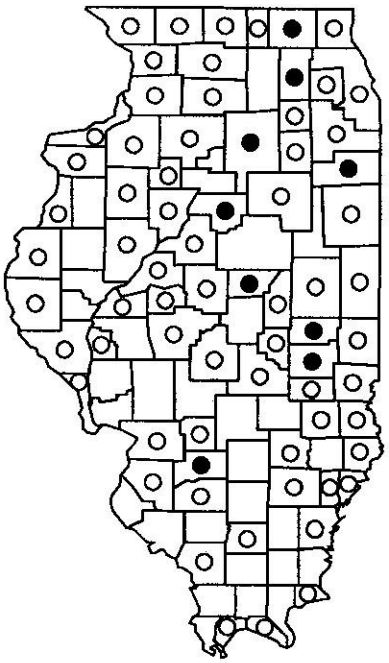
ELEPHANT-EAR **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: The elephant-ear is known from the Mississippi River drainage, south and east in the Alabama, Tombigee, and Chattahoochee river systems (Parmalee 1967). In Illinois, it is presently restricted to the Ohio and Wabash rivers (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: The elephant-ear formerly had a much larger range in Illinois with historic records from the Illinois, Mississippi, Ohio and Wabash rivers (Starrett 1971, Cummings and Mayer 1992). It was extirpated from the Illinois River by 1930.
Habitat: The elephant-ear inhabits rivers with swift-flowing currents, and a bottom composed of stones and coarse gravel usually at a depth of at least 2 m (Parmalee 1967).
Reason for Status: Populations of the elephant-ear have declined in Illinois, and it has been eliminated from the Illinois and upper Mississippi river systems. Since this species is presently restricted to the Ohio and Wabash Rivers in Illinois, it is threatened by dredging, impoundments, sand and gravel mining, siltation, and domestic, industrial, and agricultural pollution.
Management Recommendations: This mussel would benefit from efforts to restrict dredging, impoundments, and navigational improvements in the Wabash and Ohio Rivers. Additionally, there is a need for increased efforts to reduce undue siltation and pollution in the Wabash and Ohio Rivers.

Elliptio dilatata (Rafinesque)

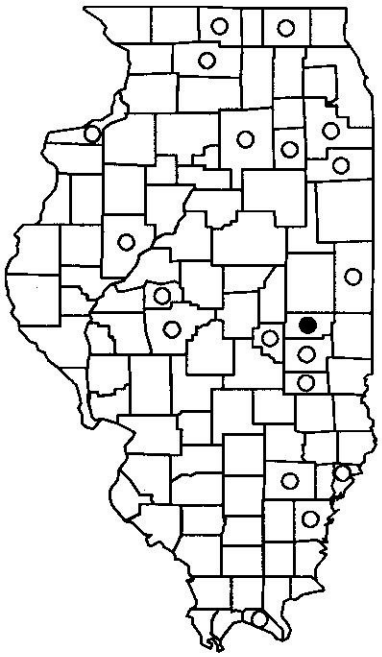
SPIKE **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: The spike formerly occurred throughout the entire Mississippi River drainage from the St. Lawrence River south to Florida and west to the Guadelupe River in Texas (Parmalee 1967). It is presently still fairly widespread but sporadic in the Midwest (Cummings and Mayer 1992).
Former Illinois Distribution: Parmalee (1967) listed this species as occurring in most of Illinois' small streams with suitable habitat, and as locally common in a few large rivers such as the Wabash, Ohio, Rock, and Mississippi rivers. This species was formerly locally abundant in the Illinois River but had been nearly or completely eliminated by 1967 as a result of pollution and siltation (Parmalee 1967).
Habitat: Small to large streams and lakes in mud or gravel substrates (Cummings and Mayer 1992).
Reason For Status: Populations of this formerly widespread species have been greatly reduced in Illinois, presumably as a result of widespread siltation and pollution of Illinois streams.
Management Recommendations: Pollution and siltation have greatly diminished populations of this species in Illinois. Increased efforts to reduce siltation and improve water quality in Illinois streams and rivers would benefit this and other species of imperilled freshwater mussels in the state.

Epioblasma triquetra (Rafinesque)

SNUFFBOX **UNIONIDAE** **Status:** Endangered in Illinois



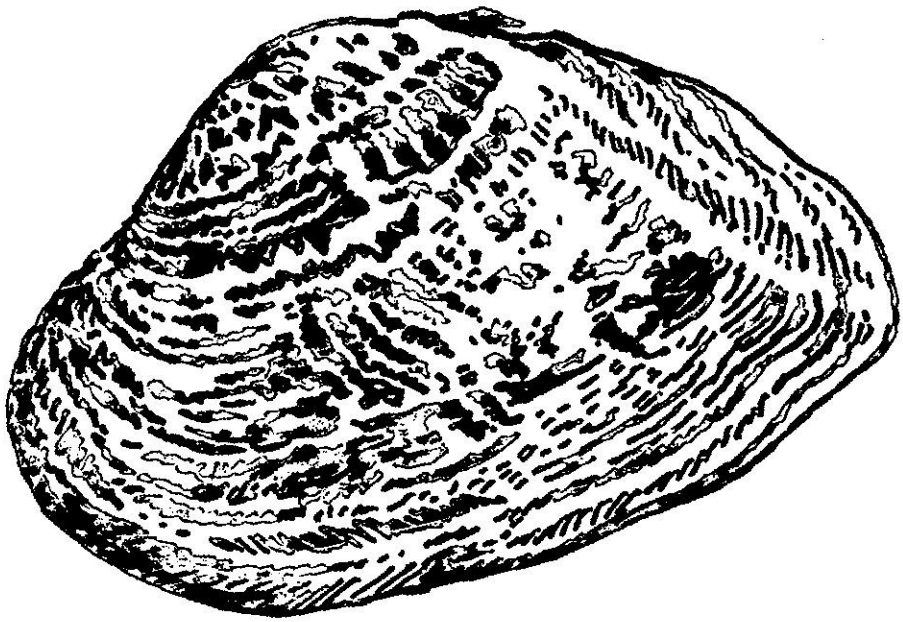
Present Distribution: The snuffbox is known from the Mississippi River drainage, from New York and Minnesota south to northern Alabama (Parmalee 1967). In Illinois it is presently known to occur only in the Embarras River (IDNR Natural Heritage database, INHS Mollusk Collection).

Former Illinois Distribution: Historically, the snuffbox was known to occur in the Illinois, Kankakee, Kaskaskia, Embarras, Sangamon, Rock, Fox, Little Wabash, Vermilion, Mississippi, Wabash, and Ohio rivers in Illinois (Cummings and Mayer 1992). Parmalee (1967) wrote that the snuffbox was apparently restricted to the northern third of Illinois, although there are a few early records from the southern part of the state.

Habitat: The snuffbox inhabits medium to large rivers where it usually inhabits bottoms composed of sand and coarse gravel, often in riffles in running water (Parmalee 1967). Individuals frequently bury themselves deeply in sand.

Reason for Status: This species has been extirpated from all of its former range in Illinois except for the Embarras River. Remaining populations of this species are threatened by increased siltation and domestic, industrial, and agricultural pollution.

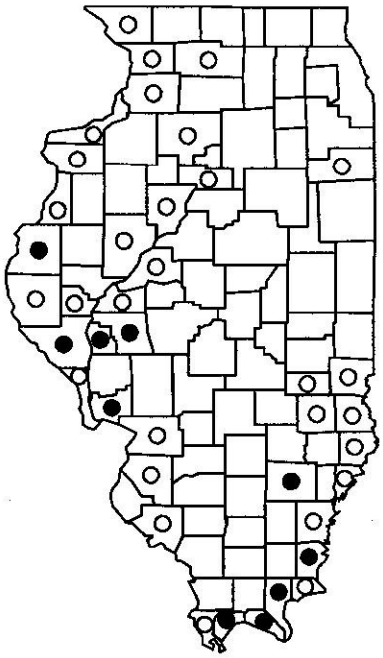
Management Recommendations: Improved soil conservation measures are needed to reduce declining water quality due to agricultural runoff and pollution. Improved protection from herbicides, pesticides, and industrial-related pollution is also needed. Protection of portions of the Embarras River as a Natural Area could help protect this species.



Epioblasma triquetra
(Snuffbox)

Fusconaia ebena (Lea)

EBONYSHELL **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: The ebonyshell is known from the Mississippi River drainage south in the Alabama and Tombigbee rivers (Parmalee 1967).
Former Illinois Distribution: This species was formerly common throughout the large rivers in the state, but by 1967 was restricted to portions of the Mississippi, lower Wabash and Ohio rivers (Parmalee 1967).
Habitat: The ebonyshell is found in large rivers in sand and gravel substrates with swift currents (Parmalee 1967, Cummings and Mayer 1992).
Reason For Status: This species was formerly abundant in Illinois but has been greatly reduced due to pollution and siltation. This species is listed as endangered in Missouri and Wisconsin, threatened in Ohio, and special concern in Minnesota (Cummings and Mayer 1992).
Management Recommendations: This mussel would benefit from efforts to restrict dredging, impoundments, and navigational improvements on the large rivers of the state. Additionally, there is a need for increased efforts to reduce undue siltation and pollution in the Wabash, Ohio and Mississippi rivers.

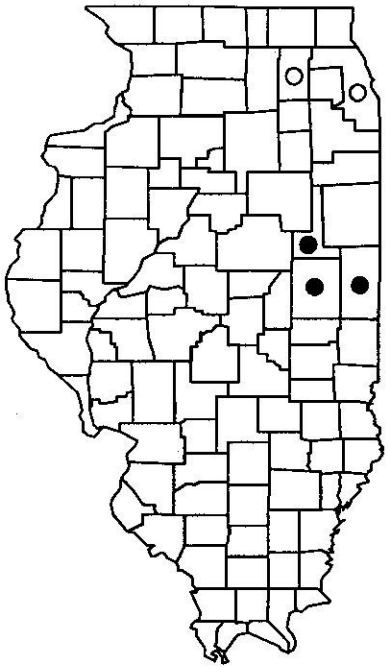
Lampsilis abrupta (Say)

PINK MUCKET **UNIONIDAE** **Status:** Endangered in Illinois
Federally Endangered

Present Distribution: The pink mucket is currently known primarily from the Tennessee, Cumberland, Black, Orange, and Merimac river systems in Alabama, Arkansas, Kentucky, Missouri, and Tennessee (Ahlstedt 1985a). It was formerly considered to be extirpated in Illinois (Cummings 1991), but was discovered in the Ohio River in Illinois (Cummings and Mayer 1992).
Former Illinois Distribution: In Illinois, this species was restricted to the lower Wabash and Ohio rivers (Cummings and Mayer 1991).
Habitat: Usually in large rivers where it occurs in moderate to fast flowing current in rubble, gravel, sand, and silt, in water depths from 0.5 to 8 m (Ahlstedt 1985a).
Reason For Status: The pink mucket was apparently always an uncommon or rare mussel. Recently, populations of this species have been reduced or eliminated as a result of impoundments, siltation, and municipal, agricultural, and industrial pollution (Ahlstedt 1985a).
Management Recommendations: Management needs for this species include habitat preservation and protection, and population and habitat research.

Lampsilis fasciola Rafinesque

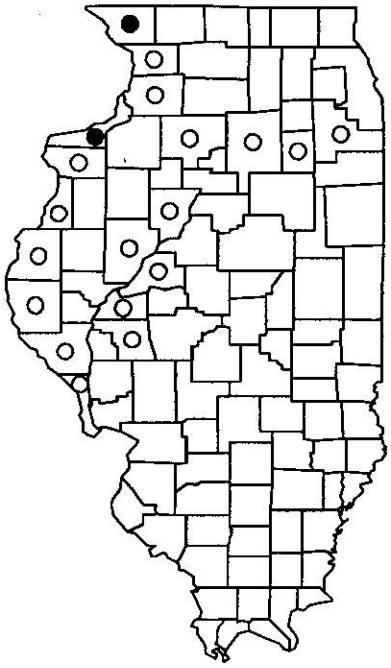
WAVY-RAYED LAMPMUSSEL **UNIONIDAE** **Status:** Endangered in Illinois



Present Distribution: The wavy-rayed lampmussel is known from the Ohio River drainage and southern Michigan (Parmalee 1967). In Illinois it is presently restricted to the Vermilion River drainage.
Former Illinois Distribution: Baker (1906) reported this species as occurring from Cook County to southern Illinois in the eastern part of the state. By 1967, however, it was considered fairly uncommon in Illinois, and was apparently restricted to the Vermilion River system in east central Illinois (Parmalee 1967).
Habitat: The wavy-rayed lampmussel is usually found on a coarse sand and gravel bottom with little mud, in current, and at depths of less than 1 m (Parmalee 1967).
Reason for Status: This mussel is restricted to one river system in Illinois where it is threatened by increased siltation and domestic, industrial, and agricultural pollution.
Management Recommendations: This species would benefit from better soil conservation measures designed to reduce siltation, agricultural runoff, and pollution.

Lampsilis higginsii (Lea)

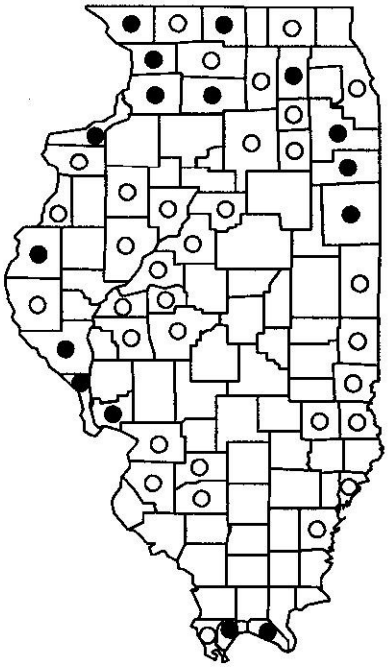
HIGGINS EYE **UNIONIDAE** **Status:** Endangered in Illinois
Federally Endangered



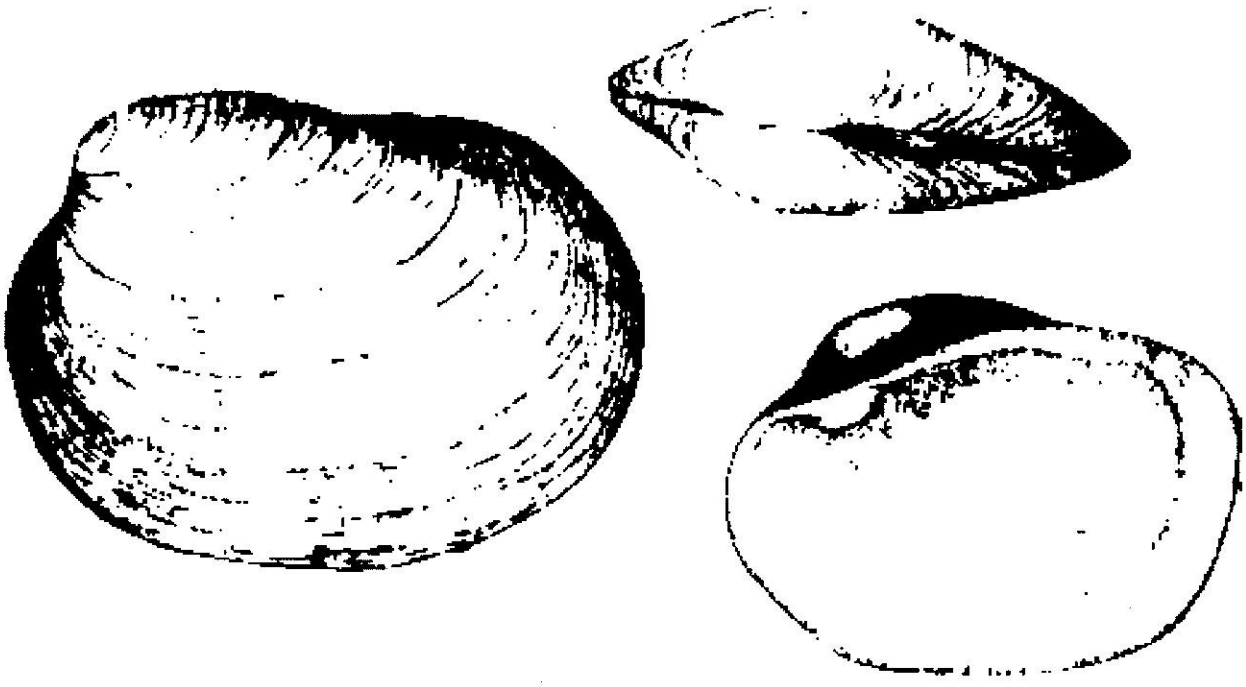
Present Distribution: The Higgins eye is presently found only in the upper Mississippi River from Minnesota and Wisconsin to Iowa and Illinois, and the St. Croix River in Minnesota and Wisconsin (Stern 1982). Formerly this species occurred in the Mississippi River drainage from Louisiana to Wisconsin (Havlik 1981). In Illinois it is presently restricted to the Mississippi River.
Former Illinois Distribution: The Higgins eye formerly occurred in the Mississippi River from its confluence with the Illinois River north; there are also records of this species from the Illinois, Spoon, and Kankakee rivers (Cummings and Mayer 1992).
Habitat: This mussel is primarily a large river species that apparently prefers mud-gravel substrates in fairly deep (3-5 m) water (Stern 1982).
Reason for Status: This species initially may have declined due to commercial harvesting; however, impoundments, decreasing water quality and channel dredging are the primary factors responsible for recent declines (Stern 1982).
Management Recommendations: The primary management needs for this species include identification and protection of essential habitat, population monitoring, and possibly the development of fish runways to facilitate the movement of glochidial host fish species through/around locks and dams (Stern 1982). Populations of this species also need to be protected from dredging and other detrimental navigational improvements in the Mississippi River.

Ligumia recta (Lamarck)

BLACK SANDSHELL **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: The black sandshell is known from the Mississippi River drainage from western New York, west to South Dakota and Kansas, north to Manitoba, Ontario, and Quebec, Canada, and south to Louisiana, Alabama, and Georgia (Parmalee 1967).
Former Illinois Distribution: The black sandshell was fairly widespread in the state where it was found in most of the major river systems (Cummings and Mayer 1992, INHS Mollusk Collection).
Habitat: This species is usually found in medium to large rivers where it occurs in riffles or raceways in gravel or firm sand (Cummings and Mayer 1992).
Reason For Status: This species is widespread but uncommon throughout much of the Midwest. The black sandshell has experienced a tremendous population decline in Illinois, and is now known from less than 25% of the counties with historic records (INHS Mollusk Collection).
Management Recommendations: Areas where this species occurs should be protected from dredging, and sand and gravel mining. Additionally, efforts to reduce siltation and pollution in water ways in which this species occurs would be beneficial.



Lampsilis higginsii
(Higgins Eye)

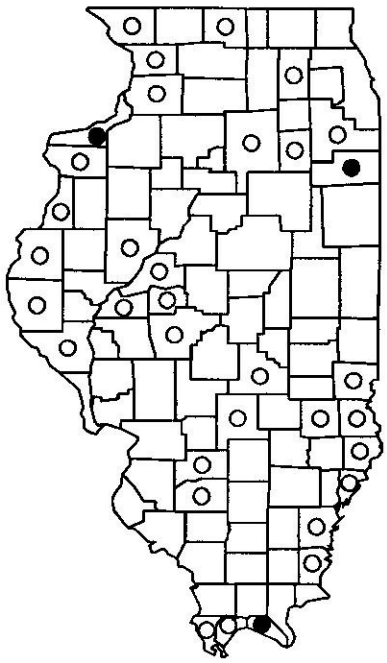
Plethobasus cooperianus (Lea)

ORANGE-FOOT PIMPLEBACK **UNIONIDAE** **Status:** Endangered in Illinois
Federally Endangered

Present Distribution: The orange-foot pimpleback is presently restricted to the Tennessee, Cumberland, and lower Ohio rivers in Illinois, Kentucky, Tennessee, and Alabama (Ahlstedt 1984a).
Former Illinois Distribution: This species has probably always been restricted to the Ohio River in Illinois. It is now apparently much less abundant than it was formerly (Cummings and Mayer 1992).
Habitat: This mussel inhabits medium to large rivers, where it is found on sand and gravel substrates (Ahlstedt 1984a).
Reason for Status: The decline of this species is primarily due to impoundments, increased siltation, and agricultural, municipal, and industrial pollution (Ahlstedt 1984a).
Management Recommendations: The protection of existing populations and presently used habitat, research examining the feasibility of reintroductions into its historic range, and life history research are the primary management needs for this species (Ahlstedt 1984a).

Plethobasus cyphyus (Rafinesque)

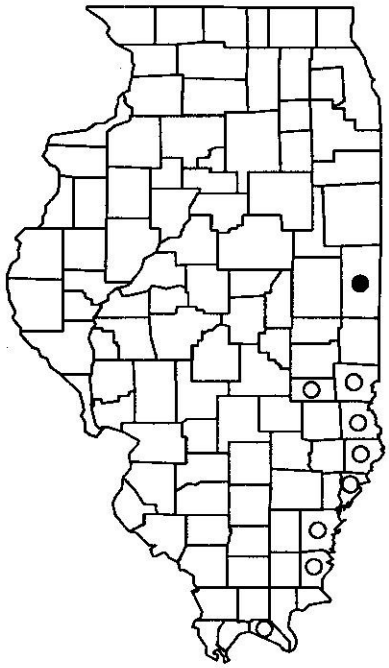
SHEEPNOSE **UNIONIDAE** **Status:** Endangered in Illinois



Present Distribution: The sheepnose is known from the Ohio, Cumberland, and Tennessee river systems; and the Mississippi River system from Iowa and Kansas north to Minnesota (Parmalee 1967). In Illinois this species is currently known from the Kankakee and Mississippi rivers (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: Parmalee (1967) wrote that this mussel was uncommon or rare in Illinois, and that it was restricted to the Mississippi (north of St. Louis), lower Wabash and Ohio Rivers. There are historical records from the Rock, Kaskaskia, Embarras, Sangamon, and Fox rivers.
Habitat: The sheepnose is usually found in current, on mud or gravel bottoms at water depths of a few cm to 2 m; however, this mussel may occasionally be found at much greater depths (Parmalee 1967).
Reason for Status: Historically this species was relatively abundant in the state, but is presently known from few localities. Most populations are apparently small and isolated. Increased siltation and domestic, industrial, and agricultural pollution are the primary threats to this species in Illinois.
Management Recommendations: Areas where this species occurs should receive improved protection from herbicides, pesticides and industrial, agricultural, and domestic pollution.

Pleurobema clava (Lamarck)

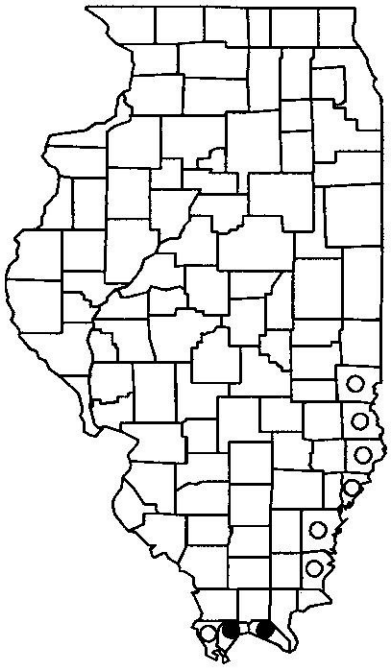
CLUBSHELL **UNIONIDAE** **Status:** Endangered in Illinois
Federally Endangered



Present Distribution: Historically this species occupied the Wabash, Ohio, Kanawha, Kentucky, Green, Monongahela, and Allegheny rivers and their tributaries. Presently it is extirpated from most of its range, and now is restricted primarily to the headwaters of its former range (Watters 1987a). In Illinois, this species still occurs in the North Fork of the Vermilion River (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: This species has apparently always had a restricted range in Illinois. Baker (1906) and Parmalee (1967) both listed this species as occurring only in the Wabash River in Illinois. Parmalee (1967) thought that it was doubtful that this mussel still was present in the state in 1967.
Habitat: The clubshell inhabits small to medium sized rivers (Watters 1987a), where it is usually found deeply buried in sand and fine gravel (Ortmann 1919).
Reason for Status: This mussel has a limited range in Illinois and has declined throughout most of its range. Presumably increased siltation, channelization, and pollution have negatively affected Illinois populations of this species.
Management Recommendations: Areas where this species is known to occur should receive increased protection from herbicides, pesticides, pollution, and agricultural soil run-off.

Pleurobema cordatum (Rafinesque)

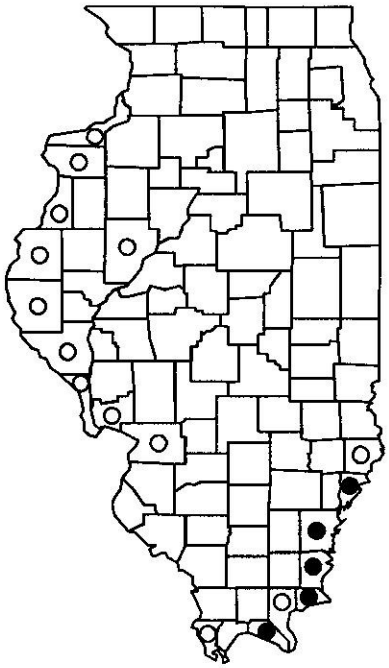
OHIO PIGTOE **UNIONIDAE** **Status:** Endangered in Illinois



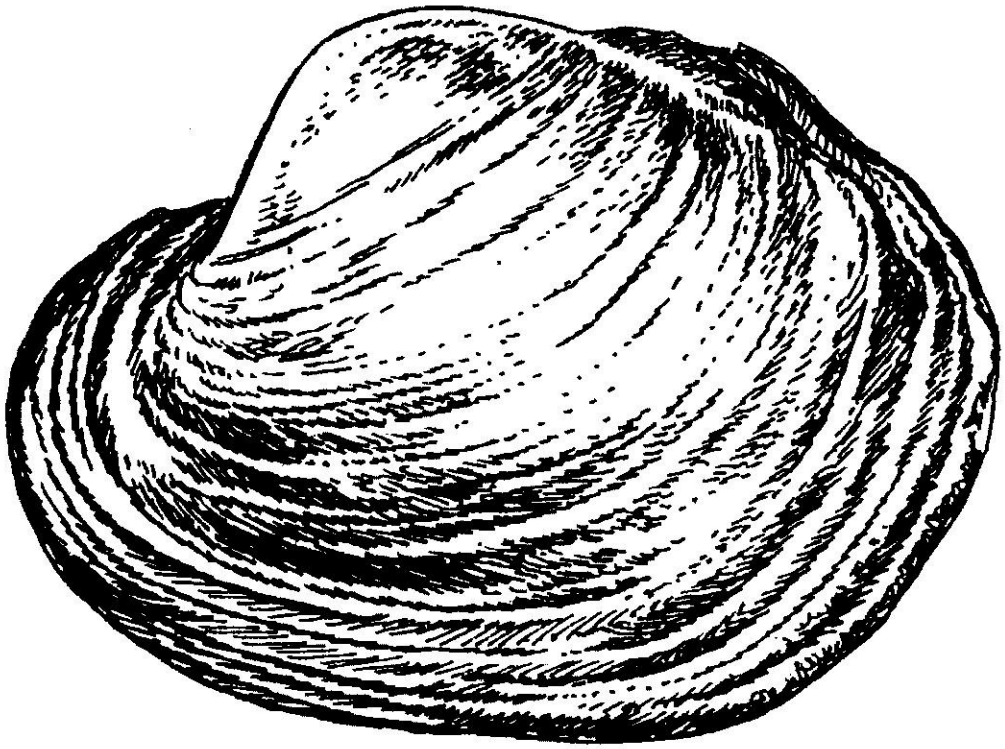
Present Distribution: The Ohio pigtoe occurs in the upper Mississippi River drainage from southwestern New York, west to Kansas and Iowa, north to upper Wisconsin (Parmalee 1967). It is presently widespread but sporadic in the Ohio River basin (Cummings and Mayer 1992). In Illinois, this species is restricted to the Ohio River.
Former Illinois Distribution: The Ohio pigtoe was formerly more widespread in Illinois, occurring in the lower Wabash and Ohio rivers (Cummings and Mayer 1992). Illinois populations of this species in the lower Wabash River have apparently been extirpated.
Habitat: Large rivers, although occasionally found in medium-sized rivers. It is usually found in riffles in a gravel, cobble, or boulder substrate at a depth of 1-3 m.
Reason For Status: This species has been extirpated from, or occurs in greatly reduced numbers throughout, considerable portions of its former range (Cummings and Mayer 1992).
Management Recommendations: This mussel would benefit from efforts to restrict dredging, impoundments, and navigational improvements on the large rivers of the state. Additionally, there is a need for increased efforts to reduce undue siltation and pollution in the Wabash and Ohio rivers.

Potamilus capax (Green)

FAT POCKETBOOK **UNIONIDAE** **Status:** Endangered in Illinois
Federally Endangered



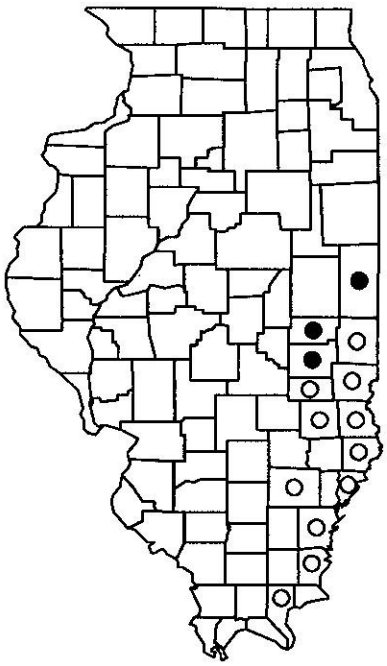
Present Distribution: The fat pocketbook occurred in the lower Wabash, upper Mississippi, Cumberland, and St. Francis rivers (Dennis 1985). In Illinois it is presently known from the lower Wabash River and possibly the Ohio River (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: The fat pocketbook was formerly fairly widespread in Illinois, occurring in the Mississippi River from approximately St. Louis to Rock Island, the Illinois River from Ottawa south, and the Wabash and Ohio rivers (Dennis 1985).
Habitat: The fat pocketbook is a large river species, occurring on both sand and mud substrates, in slow-flowing water, and at depths of only a few cm to 3 m or more (Parmalee 1967).
Reason for Status: Populations of the fat pocketbook have declined throughout its historic range due primarily to activities related to navigation and flood control, especially dredging; agricultural run-off is also believed to have negatively impacted populations of this species (Dennis 1985).
Management Recommendations: The protection of existing populations and habitat used by this species, additional searches for viable populations in the Wabash and Mississippi rivers, and life history research are the primary management needs for this species (Cummings *et al.* 1990).



Potamilus capax
(Fat Pocketbook)

Ptychobranchus fasciolaris (Rafinesque)

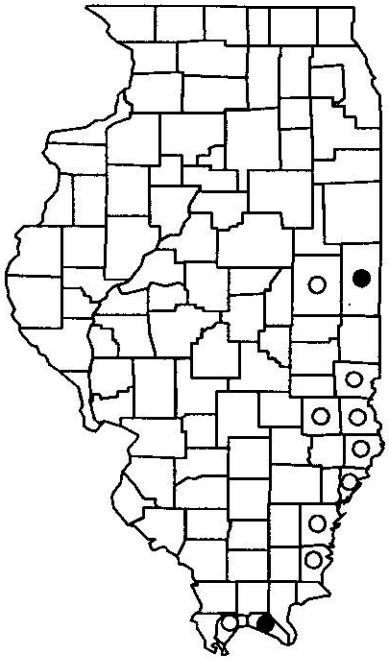
KIDNEYSHELL **UNIONIDAE** **Status:** Endangered in Illinois



Present Distribution: The kidneyshell is known from the Ohio, Tennessee, and Cumberland rivers and Lake Erie; it also occurs in Michigan and Tennessee. In Illinois it is presently known only from the Embarras and Vermilion river systems.
Former Illinois Distribution: In Illinois, the kidneyshell has apparently always been restricted to the Wabash and Ohio river drainages, with records from the Wabash, Vermilion, Little Wabash rivers and Brouilletts Creek (Baker 1906, Parmalee 1967, Cummings and Mayer 1992).
Habitat: The kidneyshell is usually found in small to medium sized rivers, but may also occur in riffle sections of large rivers (Parmalee 1967). It is usually found in coarse sand and gravel substrates, in current, at water depths of approximately 1 m (Parmalee 1967).
Reason for Status: Increased siltation and municipal, industrial, and agricultural pollution are all potential threats to this species in Illinois.
Management Recommendations: This species would benefit from better soil conservation measures targeted at reducing agricultural runoff and pollution. Improved protection from industrial and domestic pollution would also benefit this species.

Quadrula cylindrica (Say)

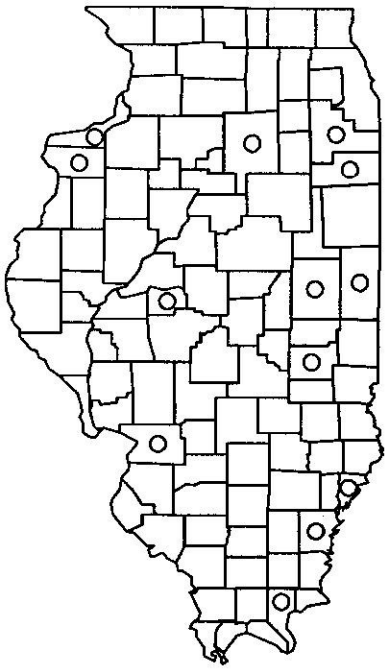
RABBITSFOOT **UNIONIDAE** **Status:** Endangered in Illinois



Present Distribution: The rabbitsfoot is known from the Ohio, Cumberland, and Tennessee river systems, the St. Lawrence drainage, and south into Arkansas, Kansas, and Oklahoma (Parmalee 1967). In Illinois, it is restricted to the North Fork of the Vermilion River and the Ohio River (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: In Illinois, the rabbitsfoot has apparently always been restricted to the Wabash and Ohio River drainages with historic records from the Vermilion, Ohio, Embarras, and Wabash rivers (Baker 1906, Parmalee 1967, Cummings and Mayer 1992).
Habitat: This mussel occurs in sand and gravel substrates in areas having current, in 2-3 m of water (Parmalee 1967).
Reason for Status: Increased siltation and municipal, industrial, and agricultural pollution are all potential threats to this species in Illinois.
Management Recommendations: This species would benefit from better soil conservation measures targeted at reducing agricultural runoff and pollution. Improved protection from industrial and municipal pollution would also benefit this species. Populations in the Wabash and Ohio Rivers should be protected form dredging and other detrimental navigation related activities.

Simpsonaias ambigua (Say)

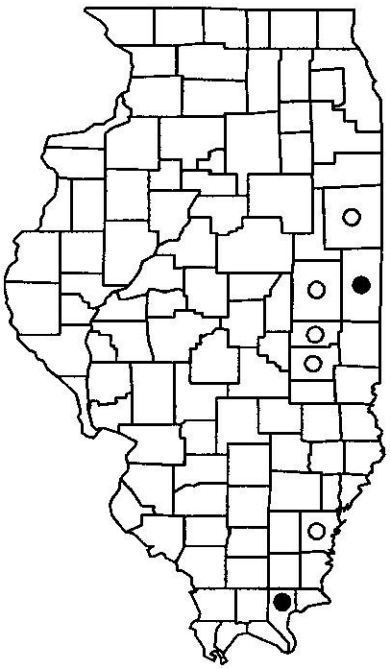
SALAMANDER MUSSEL **UNIONIDAE** **Status:** Endangered in Illinois



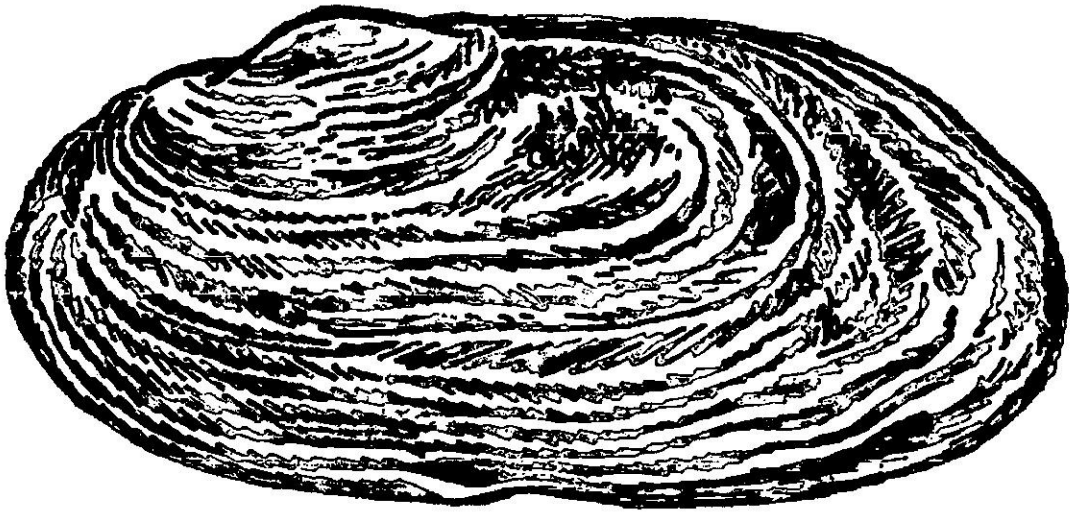
Present Distribution: The salamander mussel occurs in the Lake St. Clair, Lake Huron, and Lake Erie drainages, and the Ohio, Cumberland, and upper Mississippi river systems (Watters 1987b). In Illinois, it could possibly still be present in the Sangamon, Vermilion, and Kankakee river systems (IDNR Natural Heritage database, INHS Mollusk Collection).
Former Illinois Distribution: Historically the salamander mussel is known to have occurred in the Mississippi, Illinois, Kankakee, Vermilion, Embarras, Sangamon, and Ohio rivers in Illinois (Cummings and Mayer 1992). Parmalee (1967) considered it to be of doubtful occurrence in Illinois by 1967.
Habitat: The salamander mussel is most commonly found on mud or gravel bars under flat stones in areas of swift current (Oesch 1984, Watters 1987b). The glochidial host is the mudpuppy (Howard 1951).
Reason for Status: This species is known from few locations in Illinois, and its populations are threatened by increased siltation, domestic, industrial, and agricultural pollution, and population declines of its host species (mudpuppy).
Management Recommendations: Increased protection from herbicides, pesticides, and industrial, agricultural, and municipal pollution would benefit this species. Populations of this species also need to be protected from sand and gravel mining.

Toxolasma lividus (Rafinesque)

PURPLE LILLIPUT **UNIONIDAE** **Status:** Endangered in Illinois



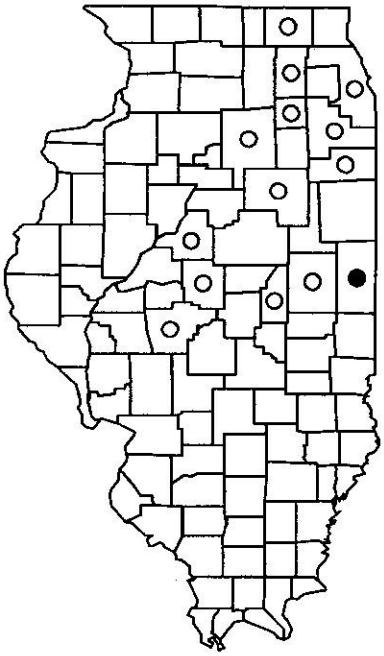
Present Distribution: The purple lilliput is found from the Ohio River drainage south to Arkansas and Georgia (Parmalee 1967). In Illinois, it still occurs in the Ohio and Vermilion river drainages.
Former Illinois Distribution: In Illinois, this mussel is restricted to tributaries of the Wabash and Ohio rivers, where it has usually been considered to be relatively uncommon or rare. (Baker 1906, Parmalee 1967).
Habitat: The purple lilliput is occasionally found in small streams on mud substrates but apparently prefers sand or fine gravel beds in shallow running water (Parmalee 1967, Oesch 1984).
Reason for Status: Populations of this mussel have declined in Illinois presumably due to increased siltation, pollution, and channelization.
Management Recommendations: Streams in which this species occurs should receive increased protection from agricultural runoff and municipal and industrial pollution. Maintenance of flowing water in riffle areas with suitable water quality, and avoidance of stream modifications such as dredging and impoundments are also need for protection of this species in Illinois.



Simpsonaias ambigua
(Salamander Mussel)

Villosa iris (Lea)

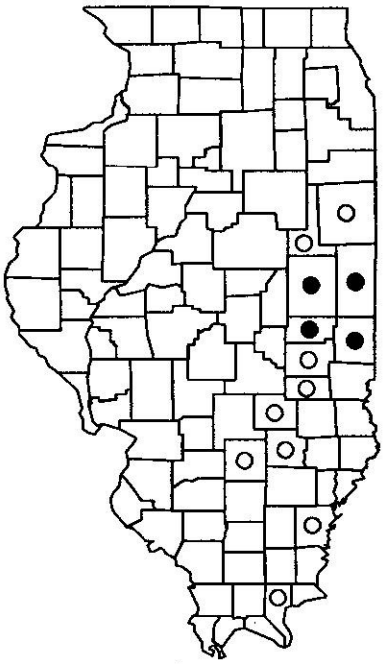
RAINBOW **UNIONIDAE** **Status:** Endangered in Illinois



Present Distribution: The rainbow occurs in the upper Mississippi and Ohio river drainages (Parmalee 1967). In Illinois, the rainbow is presently known only from the Vermilion River system (Cummings and Mayer 1992).
Former Illinois Distribution: The rainbow once inhabited creeks and small to medium sized shallow rivers in the northeastern half of the state (Baker 1906, Parmalee 1967). It has apparently been extirpated from most of its former range in Illinois.
Habitat: The rainbow inhabits creeks and small to medium sized rivers, where it occurs on sandy or sand/mud bottom substrates, in or below riffles, usually in less than 1 m of water (Parmalee 1967).
Reason for Status: Populations of the rainbow have declined in Illinois presumably as a result of increased siltation, channelization, and pollution.
Management Recommendations: Streams in which this species occurs should receive increased protection from herbicides, pesticides, and industrial agricultural, and domestic pollution.

Villosa lienosa (Conrad)

LITTLE SPECTACLECASE **UNIONIDAE** **Status:** Threatened in Illinois



Present Distribution: The little spectaclecase is known from the lower Mississippi, Ohio, and Wabash river drainages south to northern Florida and west to Texas. In Illinois, it is presently restricted to the Wabash River drainage where it occurs in the Embarras, Little Vermilion, and Vermilion rivers.

Former Illinois Distribution: The little spectaclecase historically occurred in the Vermilion, Embarras, and Little Wabash Rivers (Cummings and Mayer 1992), but now is very sporadic in occurrence in eastern Illinois.

Habitat: This species inhabits streams and small rivers, and is usually found in shallow water on a sand/mud bottom (Parmalee 1967).

Reason for Status: Increased siltation, domestic, industrial, and agricultural pollution, and competition from exotic mussel species are all potential threats to this species in Illinois.

Management Recommendations: This species would benefit from better soil conservation measures designed to reduce agricultural runoff and pollution. Improved protection from industrial and municipal pollution would also benefit this species.

CRUSTACEANS (Crustacea)

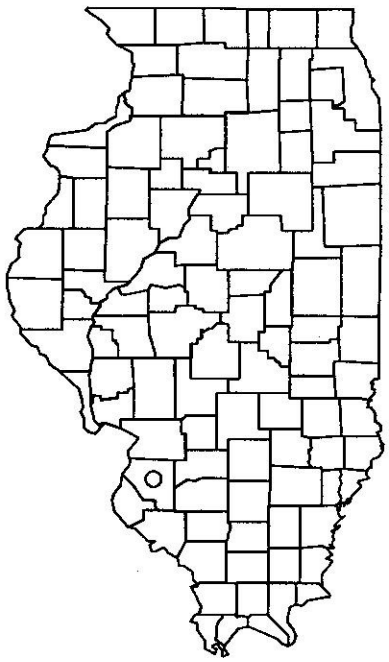
Caecidotea lesliei Lewis &Bowman

ISOPOD **ASELLIDAE** **Status:** Endangered in Illinois

Present Distribution: This rare isopod is known only from one location, a drainage tile in McDonough County, Illinois (Page and Retzer 2002).
Former Illinois Distribution: This species was only recently described by Lewis and Bowman (1981), after first being collected in 1941 from McDonough County.
Habitat: The habitat of this isopod is apparently groundwater among interstices in unconsolidated glacial drift or alluvium (White 1991). The only known occurrence of this species is from a drain tile (Lewis and Bowman 1981, White 1991). In May of 2000, four specimens of this species were collected from the type locality (Page and Retzer 2002).
Reason for Status: There is only one known location for this species, and its present status there is uncertain. It is probably limited to a small portion of the western part of the Western Illinois Till Plain where it occupies groundwater habitat. (White 1991).
Management Recommendations: The only known occurrence of this species should be protected from disturbance, drainage, and agricultural chemicals which could only threaten its continued existence.

Caecidotea spatulata Mackin and Hubricht

ISOPOD **ASELLIDAE** **Status:** Endangered in Illinois



Present Distribution: This species is known only from Illinois and Missouri (Peck and Lewis 1977).
Former Illinois Distribution: In Illinois this isopod is known only from St. Clair County. Recent attempts to find this species near the type locality in St. Clair County have been unsuccessful. (Page and Retzer 2002).
Habitat: In Illinois, this species is known to inhabit swales and springs (Peck and Lewis 1977).
Reason For Status: The areas in St. Clair County where this species is known to occur are highly industrial and threatened by industrial encroachment. Lewis (2000) visited 33 sites in St. Clair and Monroe counties, Illinois, and one site in St. Louis County, Missouri, but was not able to find this species.
Management Recommendations: Areas where this isopod is known or likely to occur should be protected from drainage, agricultural runoff and other actions that could potentially threaten the aquatic habitats this species depends on.

Crangonyx anomalus Hubricht

ANOMALOUS SPRING AMPHIPOD **CRANGONYCTIDAE** **Status:** Endangered in Illinois

Present Distribution: Presently known only from Pope County, Illinois.
Former Illinois Distribution: There are only two Illinois records for this species, a 1974 record from Pope County, and a 1992 record from a spring on private land in Pope County.
Habitat: Like other members of the family Crangonyctidae in Illinois, this species is an inhabitant of shallow groundwater habitats such as seeps, springs, caves, and subsurface cavities in limestone (White 1991).
Reason for Status: Although this species is presently known from only one locality in Illinois, it may occur elsewhere in the Shawnee Hills region (White 1991). This species is threatened by groundwater degradation and contamination. Page and Retzer (2002) revisited the 1974 site but were unable to find this species. They noted that the difficult terrain and limited samples do not rule out the species existence in the area.
Management Recommendations: Areas where this species is known or likely to occur should be protected from drainage, agricultural chemicals, and other actions that could potentially threaten groundwater habitats.

Crangonyx packardi Packard

PACKARD'S CAVE AMPHIPOD **CRANGONYCTIDAE** **Status:** Endangered in Illinois

Present Distribution: This amphipod occurs in the low interior plateaus of southern Indiana, central Kentucky, and southern Illinois (Peck and Lewis 1977, Holsinger 1986).
Former Illinois Distribution: The only Illinois records for this amphipod are from caves in Hardin, Johnson, Saline, Pike, and Union Counties (Peck and Lewis 1977).
Habitat: This species is apparently primarily restricted to caves in the Shawnee Hills Natural Division of Illinois. Page and Retzer (2002) reported a new record of this species from Bell Smith Springs in Johnson County in 1997.
Reason for Status: This species is known from only a few localities in Illinois and is threatened by groundwater degradation and contamination.
Management Recommendations: Caves where this species occurs should be protected from undue disturbance, and efforts should be made to protect the groundwater resources of these areas.

Gammarus acherondytes Hubricht & Mackin

ILLINOIS CAVE AMPHIPOD **GAMMARIDAE** **Status:** Endangered in Illinois
Federally Endangered

Present Distribution: This amphipod was originally known from four caves in Monroe and one cave in St. Clair counties, Illinois (Holsinger 1972, Peck and Lewis 1977). Recent studies indicate that this species is known from 12 caves in six drainages, all in Madison and St. Clair counties, Illinois (Lewis *et al.* 2003).
Former Illinois Distribution: The Illinois cave amphipod was first discovered in Monroe County in 1938, and found soon after in St. Clair County (Hubricht and Mackin 1940). It has apparently always been restricted to these two counties.
Habitat: This amphipod is an inhabitant of small cave streams in southwestern Illinois (Holsinger 1972).
Reason for Status: The Illinois cave amphipod is restricted to only a few cave systems in Illinois and is threatened by groundwater degradation and contamination. In recent studies by Taylor and Webb (2000), they were unable to find this species in the only St. Clair County cave from which it had been reported in spite of repeated sampling throughout the year. Also numerous attempts have been made to find this species from throughout the karst regions of Illinois, and none of the studies have found the Illinois cave amphipod outside of its present range in Monroe and St. Clair counties (Webb *et al.* 1993, Webb *et al.* 1998, Lewis *et al.* 2003).
Management Recommendations: Caves where this species occurs should be protected from undue human disturbance, and efforts should be made to protect the groundwater resources of these cave systems.

Orconectes indianensis (Hay)

INDIANA CRAYFISH **CAMBARIDAE** **Status:** Endangered in Illinois

Present Distribution: The Indiana crayfish is restricted to the Wabash river drainage in southwestern Indiana and the Saline River and Honey Creek systems in Illinois (Page 1985a).
Former Illinois Distribution: This species formerly occurred in the North Fork of the Saline river, but otherwise its historic distribution within Illinois is similar to its present distribution (Page 1985a).
Habitat: In Illinois, the Indiana crayfish inhabits rocky riffles and pools of small to medium-sized streams in the southern part of the state (Page 1985a).
Reason for Status: This species has a very limited range with only a few documented occurrences in Illinois and the rest of the United States. The streams this crayfish inhabits are threatened by pollution (due to strip mining and oil production), siltation, desiccation, and impoundment.
Management Recommendations: There is a need for additional surveys of streams in and around the presently known sites where this species occurs. Preservation and protection of areas of the Saline River and Honey Creek should be considered. Efforts should also be made to protect and possibly improve the water quality in these streams.

Orconectes kentuckiensis Rhoades

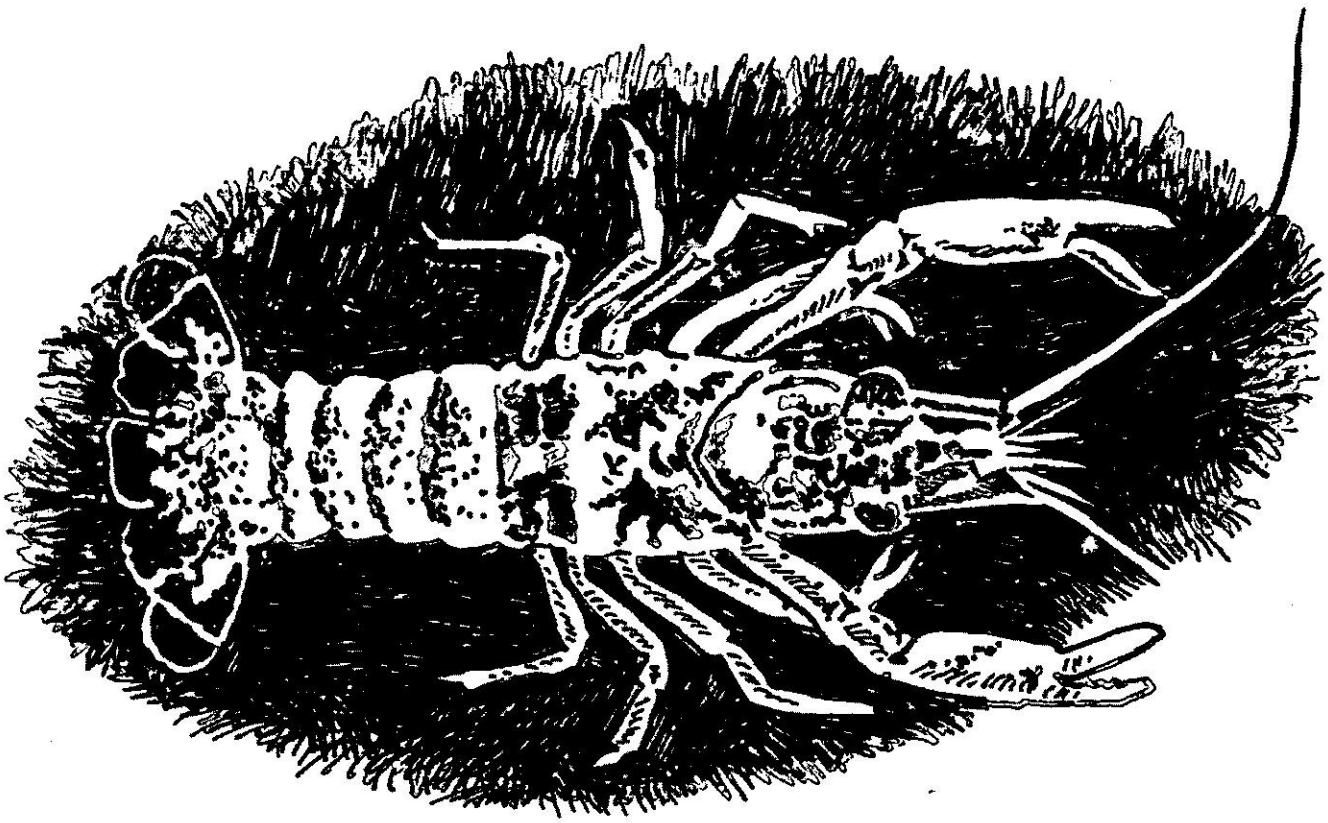
KENTUCKY CRAYFISH **CAMBARIDAE** **Status:** Endangered in Illinois

Present Distribution: The Kentucky crayfish is known only from a few small streams in southeastern Illinois and northwestern Kentucky. In Illinois, it is restricted to Big, Hosick, and Peters Creeks in Hardin County (Page 1985a).
Former Illinois Distribution: This crayfish was first reported in Illinois by Brown (1955), and was probably never more widespread in Illinois than it is today (Page 1985a).
Habitat: In Illinois, the Kentucky crayfish usually occurs in shallow, rocky pools of small streams (Boyd and Page 1978); however, Rhoades (1944) reported finding it in accumulations of brush over a mud substrate in Kentucky.
Reason for Status: This species is restricted to three small stream systems in Illinois and is threatened by disturbances such as siltation, desiccation, strip mining, and oil production.
Management Recommendations: The protection of Big Creek would conserve the largest population of this species and the largest population of another endangered crayfish, *Orconectes placidus*.

Orconectes lancifer (Hagen)

SHRIMP CRAYFISH **CAMBARIDAE** **Status:** Endangered in Illinois

Present Distribution: The oxbow crayfish occurs in the Gulf Coastal Plain with populations known from Louisiana, Mississippi, Tennessee, Texas, Arkansas, and Illinois. In Illinois, it is restricted to Horseshoe Lake in Alexander County (Page and Retzer 2002).
Former Illinois Distribution: In Illinois, the oxbow crayfish has been found in only one county. It was first discovered in Illinois in the mid 1800s (Faxon 1914) and has recently been collected (1992) from the same general area (Page and Burr 1973, Burr 1996, Page and Retzer 2002).
Habitat: In Illinois, this crayfish occupies deep waters of Horseshoe Lake (Page 1985a).
Reason for Status: In Illinois, this species is found only in one Alexander County lake. A single catastrophic event has the possibility of wiping out the entire state population of this crayfish.
Management Recommendations: The primary management need for this species in Illinois is enhanced protection of Horseshoe Lake. Periodic monitoring of the Horseshoe Lake population and surveys in other Illinois oxbow lakes in the southern part of the state might reveal additional populations.



Orconectes lancifer
(Shrimp Crayfish)

Orconectes placidus (Hagen)

BIGCLAW CRAYFISH **CAMBARIDAE** **Status:** Endangered in Illinois

Present Distribution: This species occurs in streams of the Cumberland, Tennessee, and lower Ohio River systems in Kentucky, Tennessee, and Illinois (Page 1985a). In Illinois, it is known from Big Creek in Hardin County and the lower Ohio River. Though previously thought to occur in the lower Mississippi River in southern Illinois, these records were based on misidentified specimens (Wetzel and Poly 2000).
Former Illinois Distribution: This species' former distribution within Illinois was probably similar to what it is today.
Habitat: In Big Creek, *Orconectes placidus* inhabits downstream gravel and rubble riffles, whereas in the Ohio River, it is usually encountered along rocky banks and in rocky backwater areas (Page 1985a).
Reason for Status: Most of the populations of this crayfish in Illinois are small, and could easily be eliminated. Declining water quality and other disturbances along the Ohio River could exterminate this species.
Management Recommendations: The protection of Big Creek as a natural area would protect both this species and the Kentucky crayfish. Stream modifications such as dredging and impoundments should be minimized in areas of the Ohio River where this species occurs.

Stygobromus iowae Hubricht

IOWA AMPHIPOD **GAMMARIDAE** **Status:** Endangered in Illinois

Present Distribution: This amphipod is known only from two caves and one spring in Iowa, and a flooded mine in Illinois (Holsinger 1978, 1986, Peck and Christiansen 1990).
Former Illinois Distribution: There are only three records for this species in Illinois, a 1965 record from Jo Daviess County, and a 1995 and a 1997 record from Carroll County.
Habitat: Peck and Christiansen (1990) report that this species is known in Illinois from a flooded mine, while in Iowa, it is known from a cave and a spring.
Reason for Status: This species is threatened by groundwater degradation.
Management Recommendations: Research is needed to determine the current status of this species in Illinois.

Nannothemis bella Uhler

ELFIN SKIMMER DRAGONFLY **LIBELLULIDAE** **Status:** Threatened in Illinois

Present Distribution: This dragonfly is known from the eastern U.S. and Canada but is very local in occurrence (Needham *et al.* 2000).
Former Illinois Distribution: In Illinois, this species is known only from Cook and McHenry counties (T. Cashatt, personal communication).
Habitat: This dragonfly is restricted to fens, seeps and springs.
Reason For Status: There are only two known localities for this species in Illinois despite extensive searches in suitable localities throughout the state.
Management Recommendations: Wetlands where this species occurs should receive complete protection from disturbances and development that may threaten the water level and water quality in these sensitive locations.

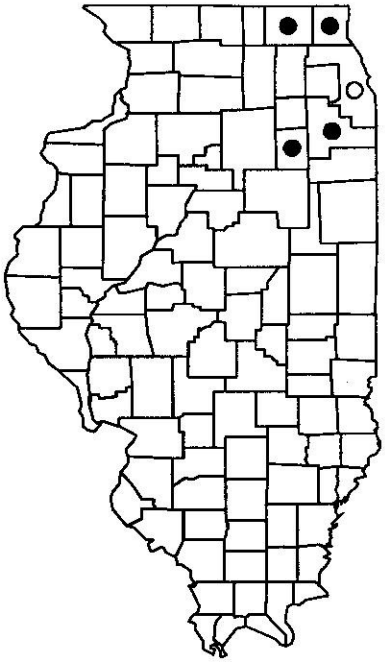
Somatochlora hineana Williamson

HINE'S EMERALD DRAGONFLY **CORDULIIDAE** **Status:** Endangered in Illinois
Federally Endangered

Present Distribution: This dragonfly was formerly known from only four localities in Ohio and Indiana. It was believed to be extinct until small isolated populations were recently discovered in Illinois and Wisconsin. It has recently been reported from isolated sites in Alabama, Illinois, Michigan, Missouri, and Wisconsin (Curry 2001).
Former Illinois Distribution: This species was not known to occur in Illinois until 1983 when it was collected in a Will County state nature preserve. It was not identified until 1987.
Habitat: The Hine's emerald dragonfly inhabits calcareous, spring-fed marshes overlaying dolomite limestone bedrock. All known occurrences in Illinois are within two km of the Des Plaines River (Cashatt 1991). The eggs of this species are probably deposited in wet sand, mud, or moss at water's edge. It probably has a three year aquatic larval stage and is known to inhabit crayfish burrows during cooler times of the year. Adults emerge beginning in May and continue emergence into August, living up to 4-5 weeks (Cashatt 1991).
Reason for Status: This species occupies a very limited range in Illinois, the Midwest, and South. Its habitat in Illinois is severely threatened by heavy industrial, human encroachment, and a proposed expressway.
Management Recommendations: Complete protection of areas harboring this species is necessary. It is believed to be very sensitive to habitat disturbance (Cashatt 1991), so strong protective measures are necessary to adequately protect it.

Aflexia rubranura (DeLong)

REDVEINED PRAIRIE LEAFHOPPER **CICADELLIDAE** **Status:** Threatened in Illinois



Present Distribution: The redveined prairie leafhopper is found in scattered localities in the Great Lakes region. Specimens have been collected from extreme eastern South Dakota, Wisconsin, northeastern Illinois, northern Michigan, and Manitoulin Island, Ontario, Canada.
Former Illinois Distribution: This species is known in Illinois only from Cook, Grundy, Lake, McHenry, and Will counties, but was probably very common when prairies were more prevalent in the state.
Habitat: The redveined prairie leafhopper occurs in tall grass prairie sites, and one time was probably a major faunal component where prairie dropseed (*Sporobolus heterolepis*) was a common prairie species (Hamilton 1999). It has recently been found at four sites in Illinois, all on state-owned property.
Reason For Status: This leafhopper has apparently become less common in recent years, and is now known from only 28 tall grass prairie sites from throughout its range (Hamilton 1994, 1999). This wingless leafhopper is adversely affected by fire management regimens, as well as the loss of habitat. Many of the sites thought to have the greatest potential for this species have been searched, but only a few redveined prairie leafhopper populations have been found.
Management Recommendations: Prairies where this species is known to occur should be protected from unnecessary disturbance, and a fire management regimen implemented that will have minimal impact on this species.

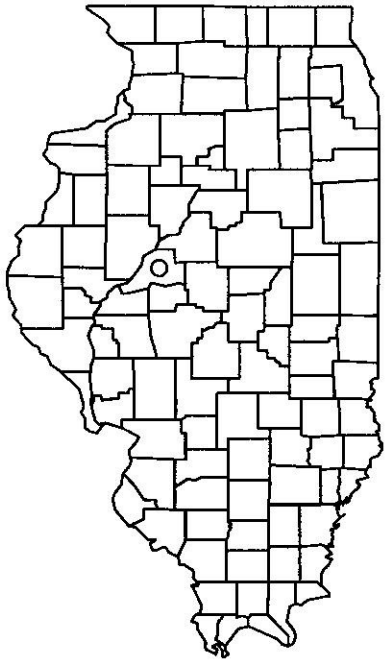
Paraphlepsius lupalus Hamilton

LEAFHOPPER **CICADELLIDAE** **Status:** Endangered in Illinois

Present Distribution: This leafhopper in known only from a Lake County state park.
Former Illinois Distribution: This species is known only from northeastern Illinois.
Habitat: This species is apparently restricted to sand dunes near the shore of Lake Michigan.
Reason For Status: This leafhopper has a very restricted range. Extensive searches in other locations with suitable habitat have been unsuccessful in finding this species (R. Panzer personal communication).
Management Recommendations: Areas of the state park where this species occurs should be protected from unnecessary human disturbances. Populations of this species at this site should be monitored on a regular basis.

Atrytone arogos (Boisduval & Le Conte)

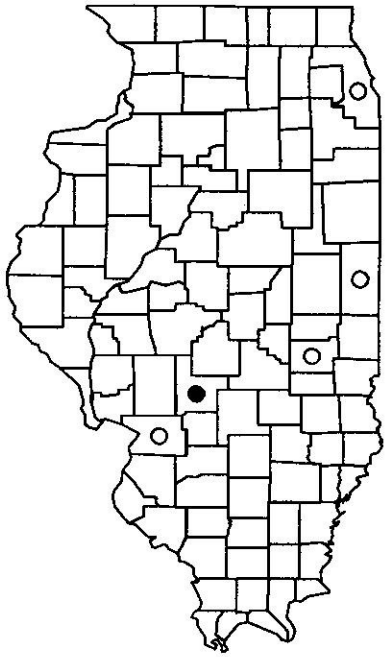
AROGOS SKIPPER **HESPERIIDAE** **Status:** Endangered in Illinois



Present Distribution: The arogos skipper occurs from Minnesota and New York south to Florida and Texas (Pyle 1981). In Illinois, the only known colony occurred in a Mason County state nature preserve.
Former Illinois Distribution: This butterfly was first located in Illinois in the 1970s after long being suspected of occurring in the state. Searches for it in other parts of the state have been unsuccessful.
Habitat: The arogos skipper occurs in prairie areas that are dominated by little bluestem (*Schizachyrium scoparium*) and big bluestem (*Andropogon gerardii.*) The larval food plants are big bluestem and little bluestem (Pyle 1981, Sedman and Hess 1985); adults are commonly encountered on pale coneflower (*Echinacea pallida*) (Heitzman and Heitzman 1987).
Reason for Status: This species is one of the rarest butterflies in Illinois, and is known from only one location in the state. It is possible that this skipper could be found in a few other locations in Illinois, but its population in the state is very low.
Management Recommendations: The one known Illinois population should be closely monitored and afforded complete protection. Research is needed to determine the influence of prairie fire on populations of this species.

Calephelis muticum McAlpine

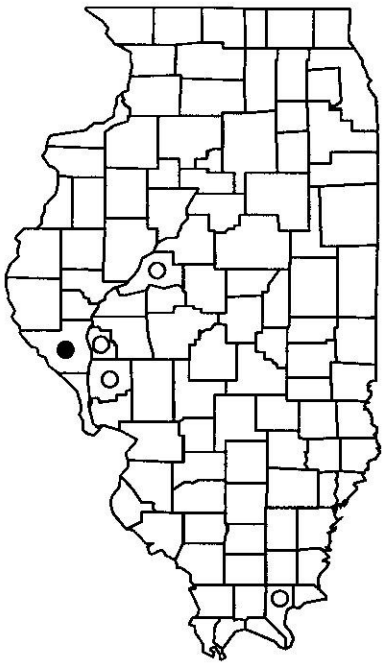
SWAMP METALMARK **RIODINIDAE** **Status:** Endangered in Illinois



Present Distribution: This butterfly is known to occur in Ohio, Michigan, Illinois, Indiana, Missouri, and Arkansas (Shull 1987, Opler 1992).
Former Illinois Distribution: Irwin and Downey (1973) list five collections in Illinois from Kane County between 1930-1939, and a questionable record from Bureau County. However, the historic Kane County records are now believed to be from Cook County (T. Cashatt, personal communication). This species was probably never common in the state but is now extremely rare. Its host plant *Cirsium muticum* (swamp thistle) is limited primarily to the northeastern quarter of the state (Mohlenbrock and Ladd 1978).
Habitat: The swamp metalmark is found in wet meadows, marshes, and bogs (Opler 1992, Bouseman and Sternburg 2001).
Reason For Status: This butterfly is known from very few locations in Illinois, and populations appear to be small.
Management Recommendations: Areas where this species is known to occur should be protected and populations monitored on a regular basis. Additional areas of suitable habitat need to be surveyed for this rare butterfly.

Hesperia metea Scudder

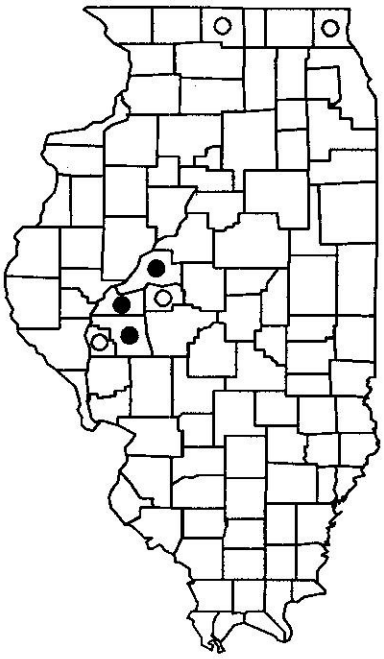
COBWEB SKIPPER **HESPERIIDAE** **Status:** Threatened in Illinois



Present Distribution: The cobweb skipper is found from Minnesota and Maine south to Texas and Florida (Pyle 1981). It is presently known to occur in one southern and three west-central Illinois counties.
Former Illinois Distribution: In Illinois, this butterfly was first collected in 1978 and has since been found in three other counties.
Habitat: The cobweb skipper inhabits sand dunes, loess-sand prairies, loess hill prairies, and barrens (Sedman and Hess 1985). The larval food plants appear to be little bluestem and big bluestem (Sedman and Hess 1985, Heitzman and Heitzman 1987). Adults are frequently found on wild hyacinth (*Camassia scilloides*), wild strawberry (*Fragaria virginiana*), rose verbena (*Glandularia canadensis*), and dwarf larkspur (*Delphinium tricorne*) (Heitzman and Heitzman 1987). This species may be dependent on fire, populations appear to be highest immediately following fire, and decline in subsequent years.
Reason for Status: This butterfly is found in very few locations in Illinois and appears to be dependent on a specific type of habitat that is rare in Illinois.
Management Recommendations: The cobweb skipper may be dependent on fire and is intolerant of vegetational change due to succession. Therefore management for early successional stages using fire appear to be important for this species' survival in Illinois. This species has a habit of relocating colonies.

Hesperia ottoe Edwards

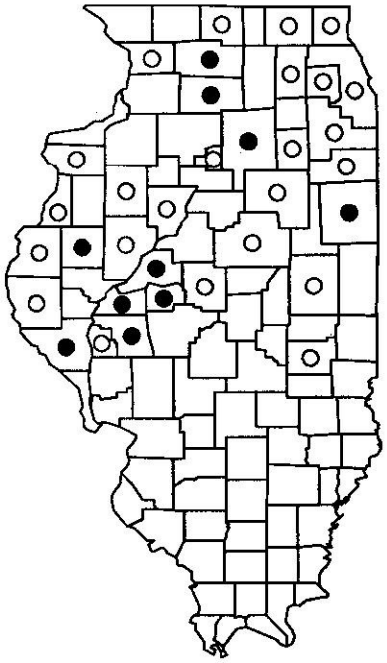
OTTOE SKIPPER **HESPERIIDAE** **Status:** Threatened in Illinois



Present Distribution: The ottoe skipper occurs from Montana and Michigan south to Colorado and Texas (Pyle 1981). In Illinois, it is primarily restricted to sandy hill prairies along the Illinois River in west-central Illinois.
Former Illinois Distribution: This species was first recorded in Illinois in 1946 from Lake County, and was subsequently found in Mason County in the early 1960s.
Habitat: In Illinois, this species occurs in sandy areas including sand prairies, dunes, and loess-sand hill prairies (Sedman and Hess 1985). It is apparently dependent upon relatively undisturbed sand-prairie habitat. The larval food plant in Illinois is not known, but is suspected to be little bluestem (Sedman and Hess 1985). In Michigan, its larval host plant is fall witch grass (*Leptoloma cognatum*) (Shull 1987). In Illinois, adults feed on blazing star (*Liatris* spp.) and purple coneflower (*Echinacea purpurea*) (Sedman and Hess 1985).
Reason for Status: This species is apparently intolerant of habitat change and is dependent upon high quality natural habitats. Nearly any change to its habitat has the possibility of wiping out a colony. Additionally, the ottoe skipper very rarely strays from its natural habitat, so preservation of sand-prairie areas are essential for this species in Illinois.
Management Recommendations: Protection of sand-prairie habitat is the greatest management need for this species in Illinois.

Speyeria idalia (Drury)

REGAL FRITILLARY **NYMPHALIDAE** **Status:** Threatened in Illinois.



Present Distribution: The regal fritillary occurs from western Indiana, southwestern Wisconsin, southeastern North Dakota and south and west to Oklahoma and Colorado. It was formerly found in the east to New Brunswick, Canada, and North Carolina in the Appalachians (Schweitzer 1993). It presently occurs sporadically in the northern half of Illinois.
Former Illinois Distribution: In the past the regal fritillary probably occurred throughout Illinois wherever prairie habitat existed. It is presently known from ten Illinois counties, though there are historical records from 24 additional counties. It usually occurs in scattered populations that are sometimes common for several years, then scarce for a time, followed by resurgence (Bouseman and Sternburg 2001).
Habitat: The regal fritillary has been found in tallgrass prairies, wet meadows, and other open habitats, and frequently in sandy areas (Bouseman and Sternburg 2001).
Reason for status: Regal fritillary populations in Illinois have declined considerably, the few remaining are small and isolated, making them vulnerable to potential population collapse. A recent global status survey suggested that from a biological perspective, the regal fritillary could be considered endangered east of the Mississippi River.
Management Recommendations: Protection of areas harboring this species is necessary as well as protecting good quality tallgrass prairie and sand prairie.

Incisalia polios Cook & Watson

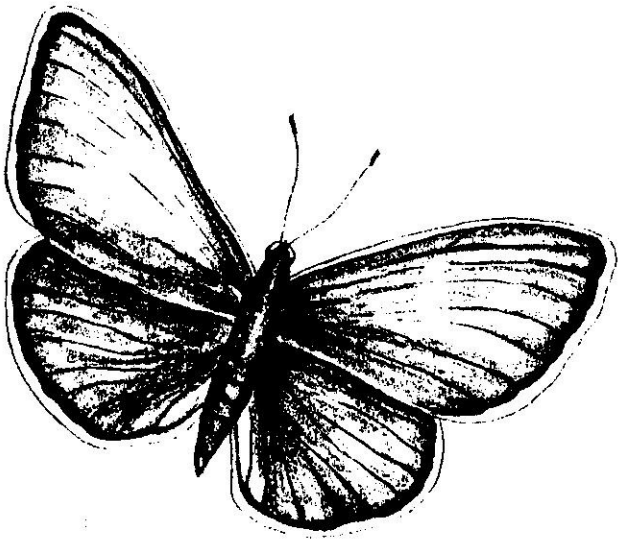
HOARY ELFIN **LYCAENIDAE** **Status:** Endangered in Illinois

Present Distribution: The hoary elfin occurs from Nova Scotia and Maine south to New Jersey, south in the Appalachians to Virginia, west across Great Lakes region and southern prairie provinces of Canada north to Alaska (Opler 1992).
Former Illinois Distribution: The hoary elfin is known from only one population in Illinois.
Habitat: Sunny glades in barrens, dunes, forest edges, and rocky ridges (Opler 1992).
Reason For Status: This species is known from only one population in the state. Its host plant, bearberry (*Arctostaphylos uva-ursi*), is Endangered in Illinois. Colonies of this species are very local (Opler 1992).
Management Recommendations: The area where this species occurs should be protected from unnecessary disturbances. Populations of this species' host plant, bearberry, should also be monitored in locations where this butterfly occurs.
Note: Bouseman and Sternburg (2001) use the name *Callophrys polios* for this species.

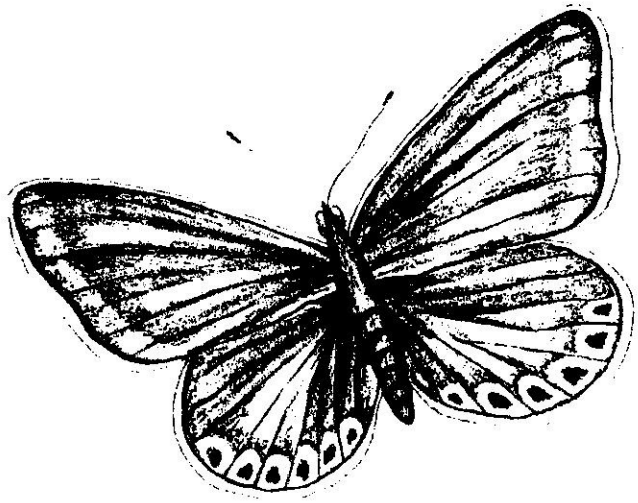
Lycaeides melissa samuelis Nabokov

KARNER BLUE **LYCAENIDAE** **Status:** Endangered in Illinois
Federally Threatened

Present Distribution: This rare butterfly is known from northern Indiana, adjacent Illinois, and central Wisconsin. It is rare and local in Illinois, historically only being known from Lake County.
Former Illinois Distribution: In Illinois, this species has always been restricted to the northeastern corner of the state. Permanent populations are probably absent, the few records appear to be due to vagrants, and perhaps, temporary populations (Bouseman and Sternburg 2001).
Habitat: In Illinois, this species is apparently restricted to sandy areas near Lake Michigan.
Reason for status: The Karner blue is always local, found in restricted populations, and is probably not a permanent resident of Illinois. Collecting by butterfly enthusiasts is also a potential threat to this species.
Management Recommendations: Protection of the areas where this species occurs, at the Illinois Beach State Park and surrounding areas, is the greatest management need for this species.



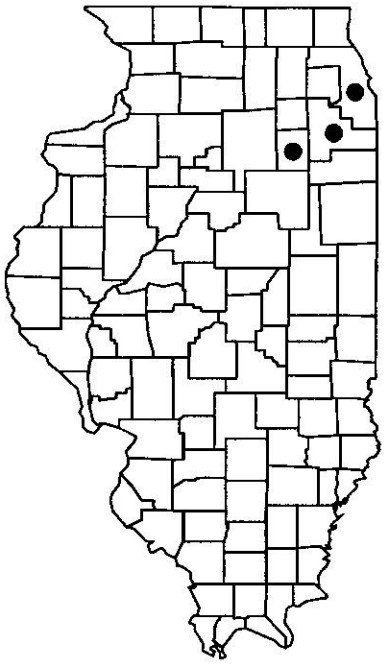
Lycaeides melissa samuelis
(Karner Blue)
Male



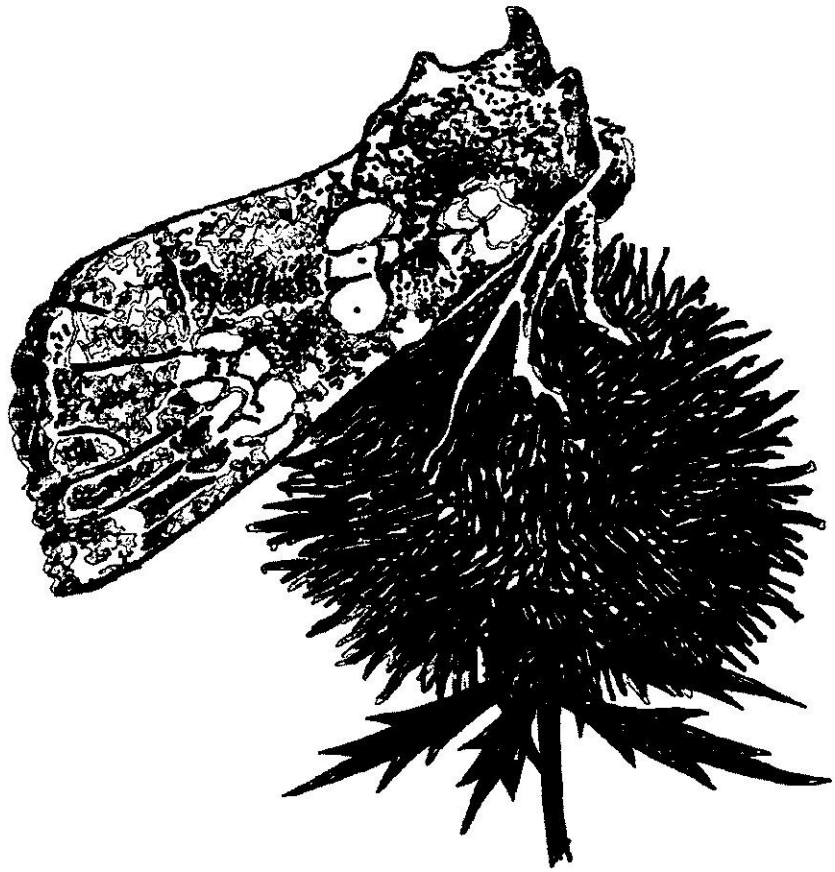
Lycaeides melissa samuelis
(Karner Blue)
Female

Papaipema eryngii Bird

ERYNGIUM STEM BORER **NOCTUIDAE** **Status:** Endangered in Illinois



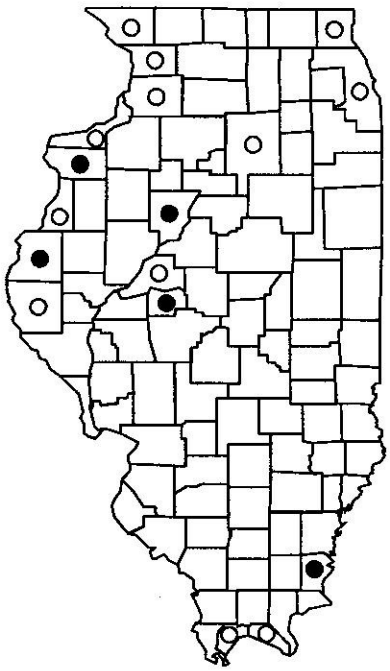
Present Distribution: The eryngium stem borer is found in northern Illinois and Indiana, Missouri, Oklahoma, Arkansas, Kentucky, and Virginia.
Former Illinois Distribution: This species was thought to be extinct in Illinois until its rediscovery in 1989 by Ron Panzer. It is now known to occur in a few state nature preserves in northeastern Illinois.
Habitat: A nocturnal, colonial species, the eryngium stem borer occurs only on large prairie areas that have abundant populations of rattlesnake master (*Eryngium yuccifolium*), its larval host plant.
Reason for Status: This species is dependent on large prairie areas with an abundance of rattlesnake master, presently an extremely rare habitat in Illinois.
Management Recommendations: Complete protection of this species is necessary. Management that benefits populations of its larval host plant (rattlesnake master) would also probably benefit this moth. Since *Papaipema* eggs are present in prairie litter during the spring and fall, fire could represent a potential threat to this species (Panzer 1988). However, mounting anecdotal evidence suggests that *Papaipema* moths can regularly survive partial burns provided that relatively large portions of their habitat remain unburned (Panzer 1988).



Papaipema eryngii
(Eryngium Stem Borer)

Acipenser fulvescens Rafinesque

LAKE STURGEON **ACIPENSERIDAE** **Status:** Endangered in Illinois



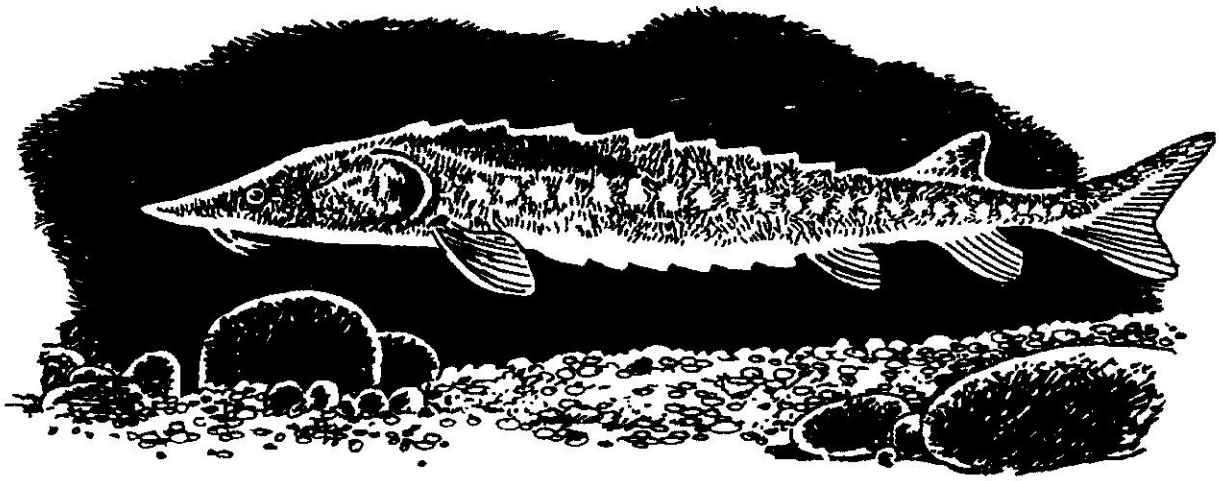
Present Distribution: The lake sturgeon ranges from the St. Lawrence-Great Lakes, Hudson Bay, and Mississippi River basins from Quebec to Alberta and south to Alabama and Louisiana (Page and Burr 1991). The species remains relatively common in the north but is rare and nearing extinction in the Mississippi, Ohio, and Missouri river drainages (Page and Burr 1991). In Illinois the Lake Sturgeon has recently been observed in the Mississippi, Rock, and Ohio rivers.

Former Illinois Distribution: The lake sturgeon was once abundant in Lake Michigan (Nelson 1876a, Jordan 1878) and also formerly occurred in the Wabash and Illinois rivers (O'Donnell 1935). The decline of the species was rapid following European settlement of the state, and by the early 1900s the lake sturgeon had become rare (Forbes and Richardson 1908, O'Donnell 1935).

Habitat: The lake sturgeon lives on the bottoms of lakes and large rivers usually in water 5-9 m deep over mud, sand, and gravel bottoms (Page and Burr 1991). It was recently found in low densities in the main channel of pool 26 of the Mississippi River (Dettmers *et al.* 2001). During the same study, this species was not found in the lower Illinois River channel.

Reason for Status: The demise of this species has been caused by many factors, including an inability to reach upstream spawning grounds because of dams and the destruction of spawning and feeding grounds by channelization, siltation, impoundment, pollution, and overfishing (Trautman 1957, Harkness and Dymond 1961, Pflieger 1971, Smith 1979). Overfishing may be especially harmful to the lake sturgeon because it does not spawn until it is about 20 years old (Harkness and Dymond 1961), and many individuals are likely to be captured before reaching maturity.

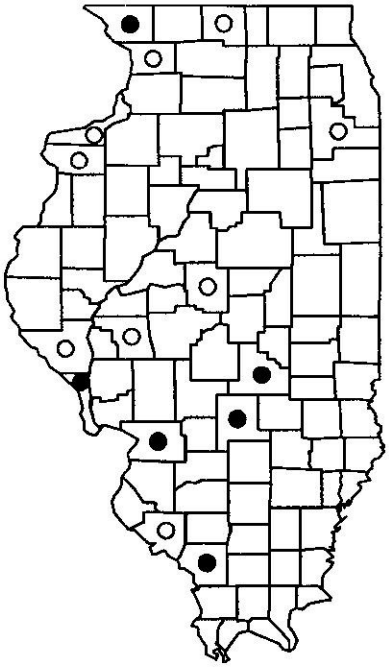
Management Recommendations: As is true for many other decimated fishes in Illinois, restoration of clean water is necessary for the recovery of the lake sturgeon. Further modifications of the large rivers of the state, particularly by impoundment, channelization, and siltation, will exacerbate the decline of the species.



Acipenser fulvescens
(Lake Sturgeon)

Ammocrypta clarum Jordan & Meek

WESTERN SAND DARTER **PERCIDAE** **Status:** Endangered in Illinois



Present Distribution: The western sand darter occurs in the Mississippi River from Wisconsin and Minnesota south to Mississippi and Texas and in the Lake Michigan basin in Wisconsin (Page and Burr 1991). In Illinois the western sand darter is found in the Mississippi, Kankakee, and Kaskaskia rivers. Recent records from Jackson County extend the range of this species in the Mississippi River to include southern Illinois (Dimmick 1988).

Former Illinois Distribution: Identifying the former distribution of this species in Illinois is confounded by its earlier confusion with the eastern sand darter. However, this species probably once occurred sparingly over nearly all the state except for the Wabash-Ohio drainage (Smith 1979).

Habitat: The western sand darter is restricted to sandy runs of medium to large rivers (Page and Burr 1991). It apparently avoids strong currents, preferring the quiet margins of the stream channels and shallow backwaters, and is intolerant of excessive siltation and turbidity (Pflieger 1975).

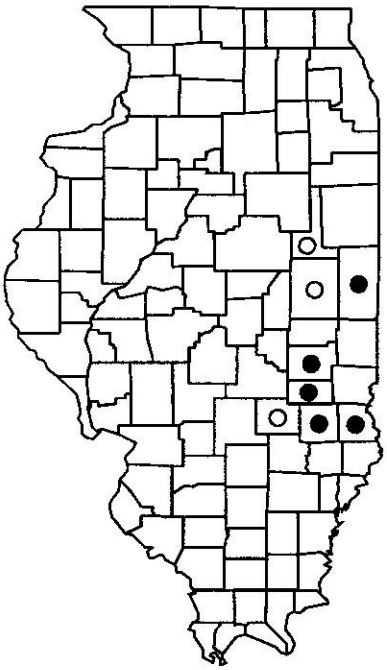
Reason For Status: Siltation, impoundments, and related stream degradation have greatly reduced populations of this species within Illinois (Smith 1979, Page 1983).

Management Recommendations: Streams known to support this species must be protected from siltation and excessive turbidity in order to reduce the risk of extirpation for this species in Illinois. Also, more natural hydrologic regime on the Mississippi and Kaskaskia Rivers may promote stable or increases in populations.

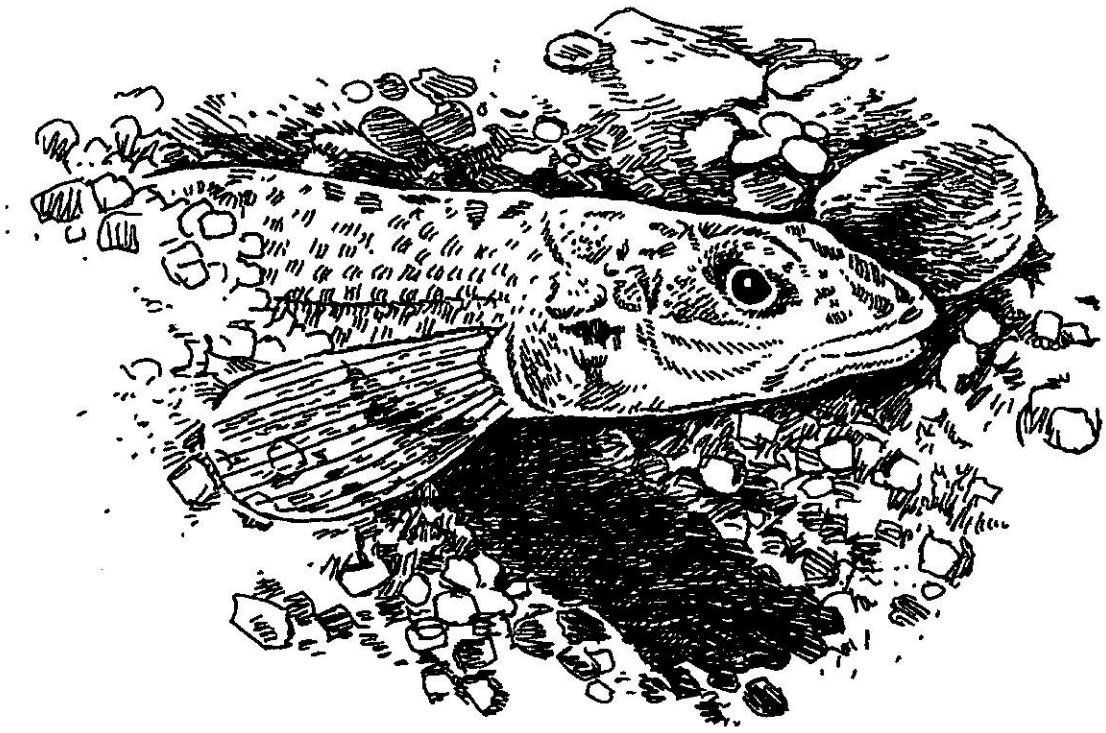
Note: This species is also referred to as *Etheostoma clarum* (Page and Burr 1991).

Ammocrypta pellucidum (Agassiz)

EASTERN SAND DARTER **PERCIDAE** **Status:** Threatened in Illinois



Present Distribution: The eastern sand darter occurs in the St. Lawrence River drainage, southern Quebec, Vermont, New York, and in the Great Lakes and Ohio basins from western New York to eastern Illinois and south to Kentucky (Page and Burr 1991). In Illinois, the eastern sand darter is restricted to the Vermilion, Embarras, and Little Wabash river systems (Smith 1979).
Former Illinois Distribution: The eastern sand darter was formerly more general in occurrence in the Embarras, Little Wabash, and Wabash river systems.
Habitat: The eastern sand darter occurs in sandy runs of small to medium rivers with high water quality and a water depth of 60 cm or more (Smith 1979, Page and Burr 1991).
Reason For Status: Siltation, impoundments, and declining water quality have decimated populations of this species in Illinois and throughout its range (Smith 1979, Page and Burr 1991). Recent increases in siltation in the Embarras River may further threaten this species' status in the state.
Management Recommendations: Efforts must be made to protect and maintain high water quality and clean sandy bottoms in the few streams in which this darter occurs.
Note: This species is also referred to as *Etheostoma pellucidum* (Page and Burr 1991).



Ammocrypta pellucidum
(Eastern Sand Darter)

Catostomus catostomus (Forster)

LONGNOSE SUCKER **CATOSTOMIDAE** **Status:** Threatened in Illinois

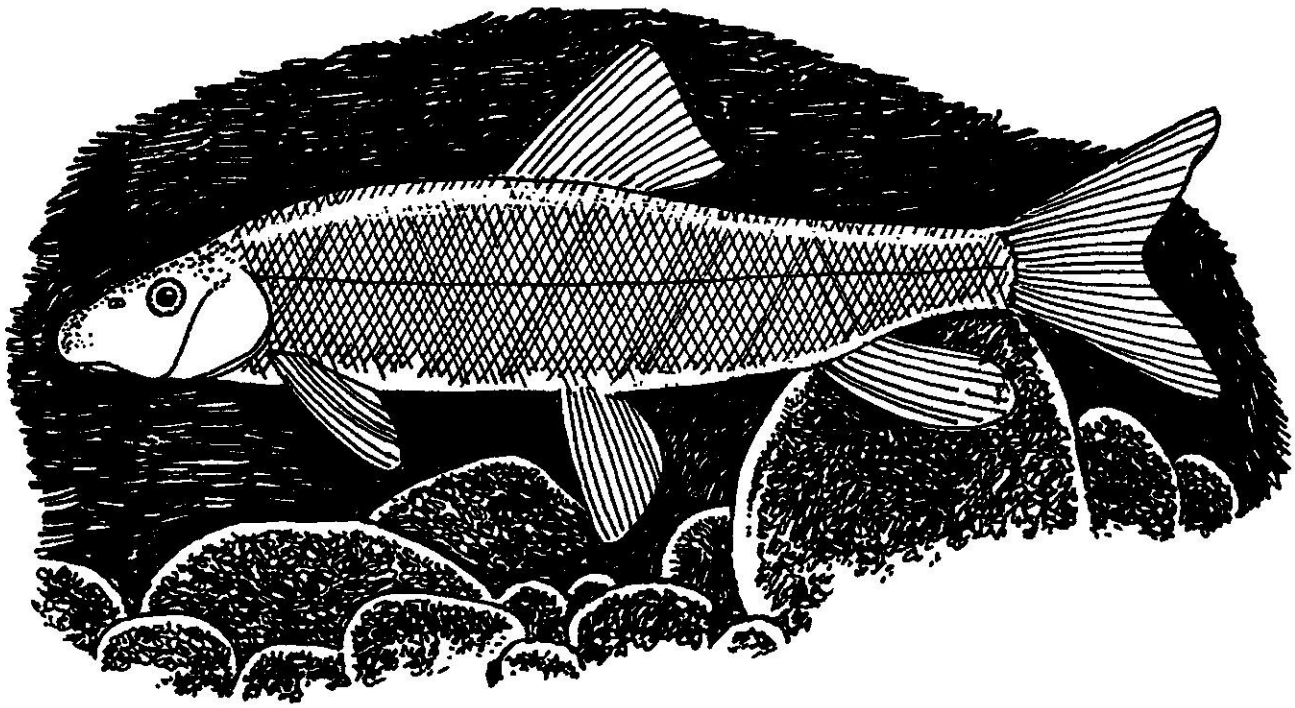
Present Distribution: The longnose sucker is the most widespread sucker in North America, occurring in the Atlantic, Arctic, and Pacific basins throughout Canada and Alaska including the Great Lakes basin and Mississippi River (Page and Burr 1991). All Illinois records are from Lake Michigan where small numbers of this species are seen in most years.

Former Illinois Distribution: The longnose sucker was formerly considered to be abundant in Lake Michigan (Jordan 1878) and in Illinois has always been confined to Lake Michigan (Smith 1979).

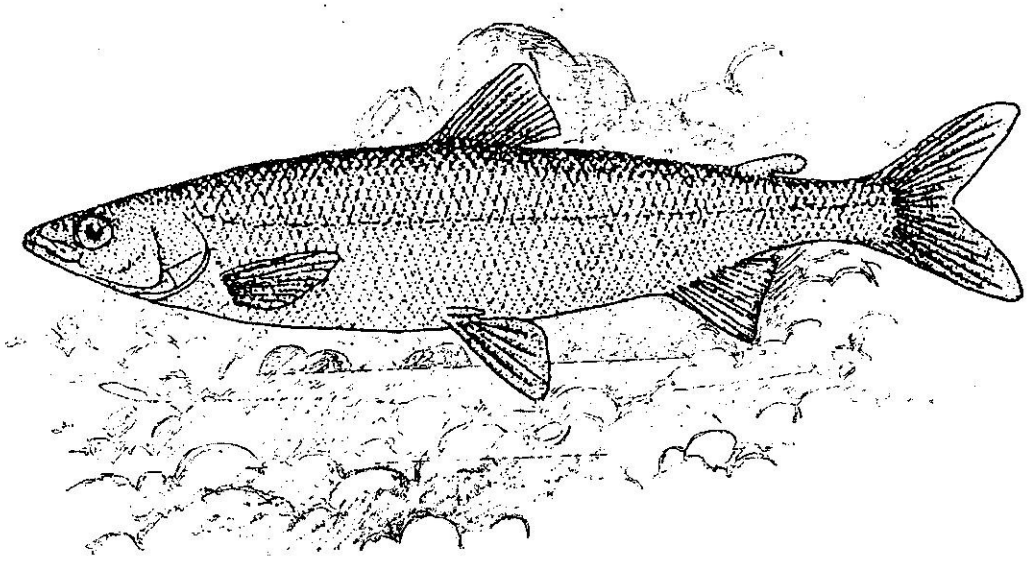
Habitat: The longnose sucker usually occurs in clear, cold, deep water of lakes, and tributary streams (Page and Burr 1991). It has been taken at depths of approximately 200 m in the Great Lakes (Page and Burr 1991). In Ohio the species enters water less than 8 m deep only in spring, presumably to spawn (Trautman 1957).

Reason for Status: The longnose sucker is threatened in Lake Michigan because of the deteriorating quality of the water and the ecological imbalance caused by introductions of non-native fishes.

Management Recommendations: Attempts are under way to prevent further deterioration of the natural environment of Lake Michigan and eventually to restore its native biota. If the attempts are successful, the threatened longnose sucker, cisco, and lake whitefish will all be among the beneficiaries.



Catostomus catostomus
(Longnose Sucker)



Coregonus artedi
(Cisco)

Coregonus artedi Lesueur

CISCO **SALMONIDAE** **Status:** Threatened in Illinois

Present Distribution: Widespread throughout much of Canada and the northern United States in the Great Lakes, Arctic and upper Mississippi River basins to northern Ohio and Illinois (Page and Burr 1991). The cisco has one of the most extensive ranges of any North American species of *Coregonus*. It is extremely rare in Illinois, occurring only in Lake Michigan.

Former Illinois Distribution: The cisco was formerly very abundant in Lake Michigan (Jordan 1878, Nelson 1876a) and was possibly once the most abundant food fish in the Great Lakes (O'Donnell 1935). Completion of the canals between Lake Michigan and the Illinois River allowed the cisco to disperse occasionally as far down the river as Meredosia (Large 1903). Subsequent pollution of the river and canals restricted the species in Illinois once again to Lake Michigan (Smith 1979).

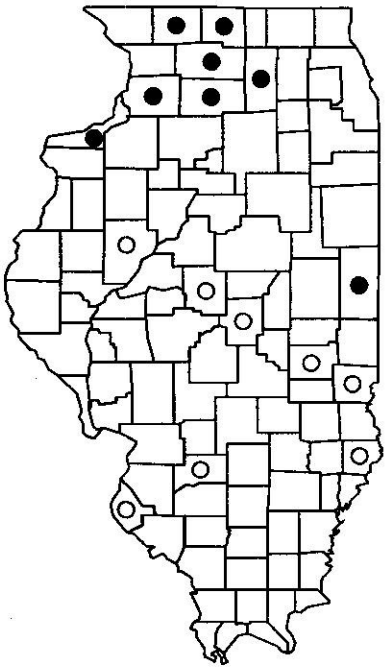
Habitat: The cisco lives in deep waters of large lakes and occasionally in large rivers. The depth at which schools have been found varies according to season and temperature; Dryer (1966) found an all-season depth range of 15-55 m.

Reason for Status: Until the late 1940s the cisco was common in Lake Michigan and was a commercially valuable fish. The introduction of the parasitic sea lamprey (*Petromyzon marinus*) caused the population of the cisco to decline. The subsequent control of the sea lamprey has failed to restore a large population of ciscoes, apparently because of competition with the bloater (*Coregonus hoyi*) and later with an introduced species, the ecologically similar alewife (*Alosa pseudoharengus*). Hrabik *et al.* (1998) found that the introduced rainbow smelt (*Osmerus mordax*) and the cisco have similar temperature preferences, and that adult smelt can heavily prey on young cisco.

Management Recommendations: Restoration or partial restoration of the natural character of Lake Michigan, especially a reduction in industrial and municipal pollution and eradication of the alewife and rainbow smelt, might enable the cisco to reestablish a large population.

Erimystax x-punctatus (Hubbs & Crowe)

GRAVEL CHUB **CYPRINIDAE** **Status:** Threatened in Illinois



Present Distribution: The gravel chub occurs in the Ohio River basin from New York and the Mississippi River basin from southern Wisconsin and Minnesota south to the Quachita River drainage, Arkansas (Page and Burr 1991). In Illinois the most recent reports of this species are from the Rock River system in northwestern Illinois and a recent record from the Wabash drainage in southeastern Illinois.
Former Illinois Distribution: The gravel chub was once widespread around the state and occurred sporadically throughout most of central Illinois but was probably never common (Smith 1979). Historically it was very common in the Rock River drainage but less common in the in the Mississippi and Wabash rivers.
Habitat: In Illinois the gravel chub occupies small rivers where it occurs in rather deep riffles and channels of moderate to very fast current over a substrate of gravel or firm sand-gravel (Smith 1979)
Reason For Status: This species was once widespread and relatively common around the state and has recently had a drastic decline it its range in Illinois. Nearly all recent records are from the Rock River system. The reason for this species decline is almost certainly the increase in silt in streams over most of the state. The gravel chub can exist only in channels and raceways where the current keeps the gravel bottom swept clean of silt (Smith 1979).
Management Recommendations: Protection from siltation and water control structures is the primary management needs for the gravel chub in Illinois.

Etheostoma camurum (Cope)

BLUEBREAST DARTER **PERCIDAE** **Status:** Endangered in Illinois

Present Distribution: The bluebreast darter ranges from the Ohio basin in western New York to eastern Illinois, and south to the Tennessee River in North Carolina and Tennessee (Page and Burr 1991). The species is sporadically distributed and is absent from many rivers within its range. In Illinois the bluebreast darter is moderately common in the Middle Fork of the Vermilion River in Vermilion County, between Collison and Kickapoo State Park (Smith 1979) and in the Salt Fork of the Vermilion River (L.M. Page, Illinois Natural History Survey, unpublished data).

Former Illinois Distribution: O'Donnell (1935) believed that the bluebreast darter may have formerly occurred elsewhere in central and southern Illinois, although there are no historic records for anywhere in the state except the Vermilion River system. Its recent rediscovery in the Salt Fork extends its known range in Illinois to include all of its known former range.

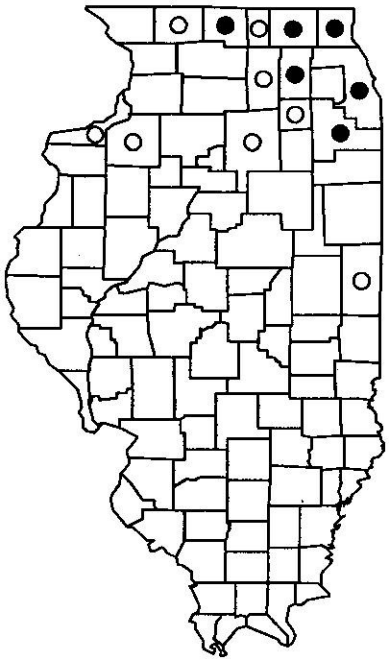
Habitat: Adults are almost always found near large boulders in fast riffles of large, clear streams at a depth of 10 to 30 cm. Young are usually found in the same riffles but associated with somewhat smaller stones in shallower water.

Reason for Status: Illinois is on the edge of the range of the bluebreast darter, and the Vermilion River system is the only Illinois stream system the species is known to occupy. The Middle Fork of the Vermilion River is one of the finest aquatic ecosystems in Illinois and supports a great diversity and abundance of organisms (Smith 1971, Evers and Page 1977). However, the water quality of the Middle Fork has deteriorated, primarily as a result of agricultural runoff, and fish populations are smaller than formerly.

Management Recommendations: Acquisition of the Middle Fork as a river corridor park has helped to protect the species, but a reduction of agricultural pollution and municipal effluents is also needed to ensure the security of the bluebreast darter in Illinois.

Etheostoma exile (Girard)

IOWA DARTER **PERCIDAE** **Status:** Threatened in Illinois



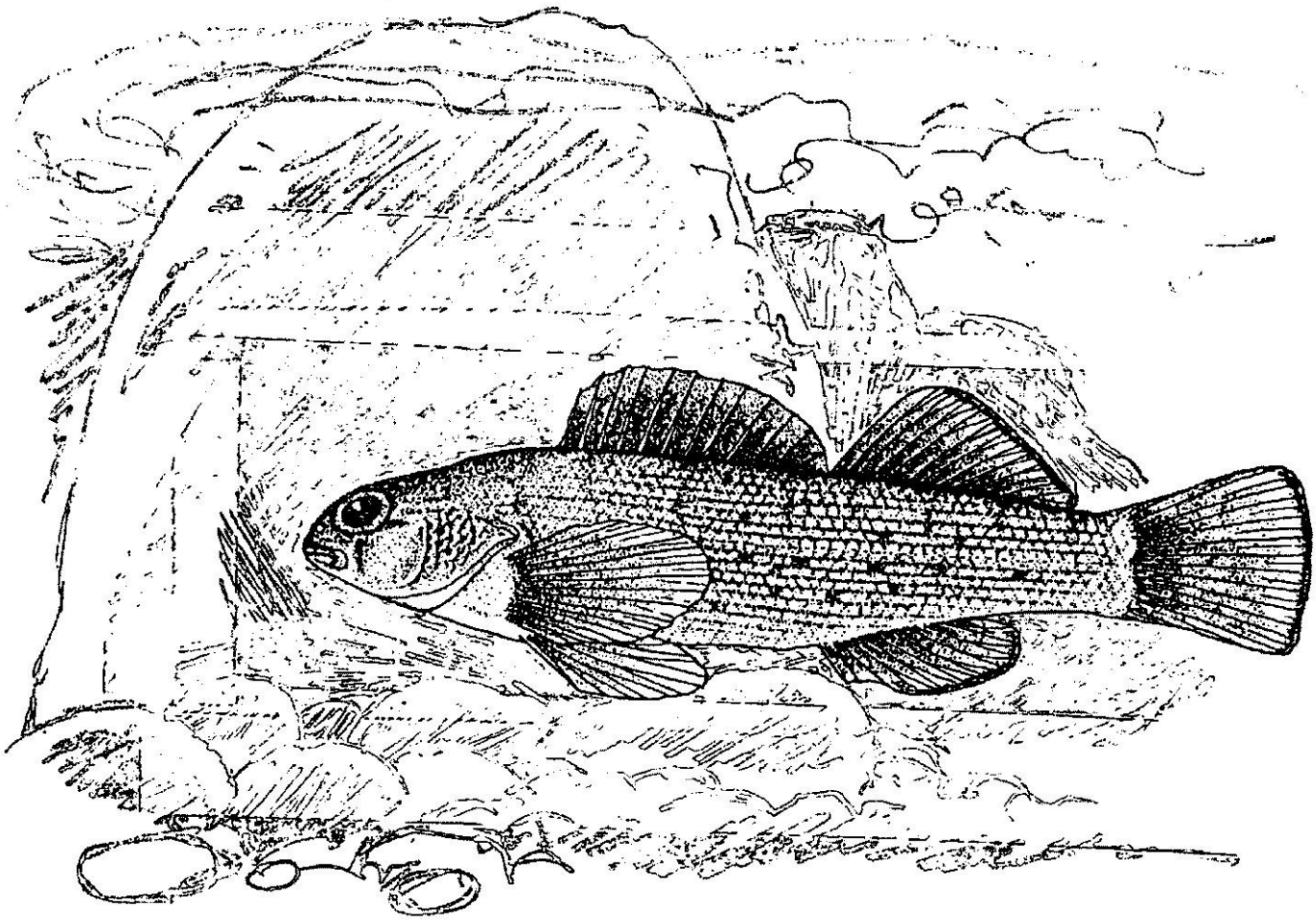
Present Distribution: The Iowa darter occurs in the St. Lawrence River, Great Lakes, Hudson Bay, and Mississippi River basins from southern Quebec to northern Alberta south to Ohio, Illinois, and Colorado (Page and Burr 1991). In Illinois it is known from glacial lakes in northeastern Illinois, a few streams in extreme northern Illinois, and a small stream in Vermilion County.

Former Illinois Distribution: This species was formerly generally distributed throughout the northern fourth of Illinois including the upper Illinois River (Smith 1979).

Habitat: The Iowa darter occurs in clear well-vegetated lakes, sloughs, and streams where it occurs in quiet pools over a mud or clay bottom with detritus and brush (Smith 1979, Page and Burr 1991).

Reason For Status: This species' decimation in Illinois is probably the result of habitat degradation, including pollution, drainage of wetlands, and introductions of nonnative species. This species is presently known from only a few locations, and its habitat is susceptible to degradation. Continued urbanization of northeastern Illinois will pressure existing populations.

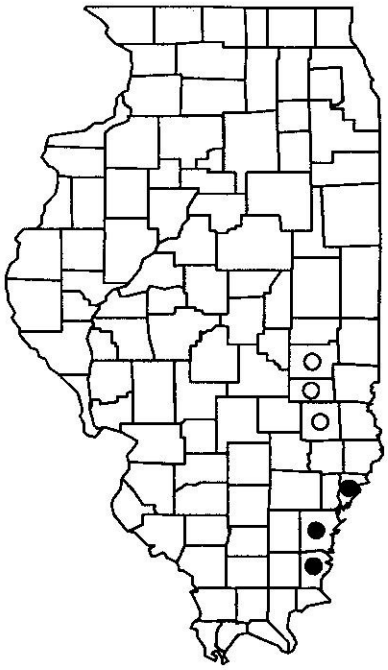
Management Recommendations: Maintenance and restoration of water quality in areas supporting this species are needed, especially in streams and lakes where populations of this species continue to decline.



Etheostoma camurum
(Bluebreast Darter)

Etheostoma histrio Jordan & Gilbert

HARLEQUIN DARTER **PERCIDAE** **Status:** Endangered in Illinois



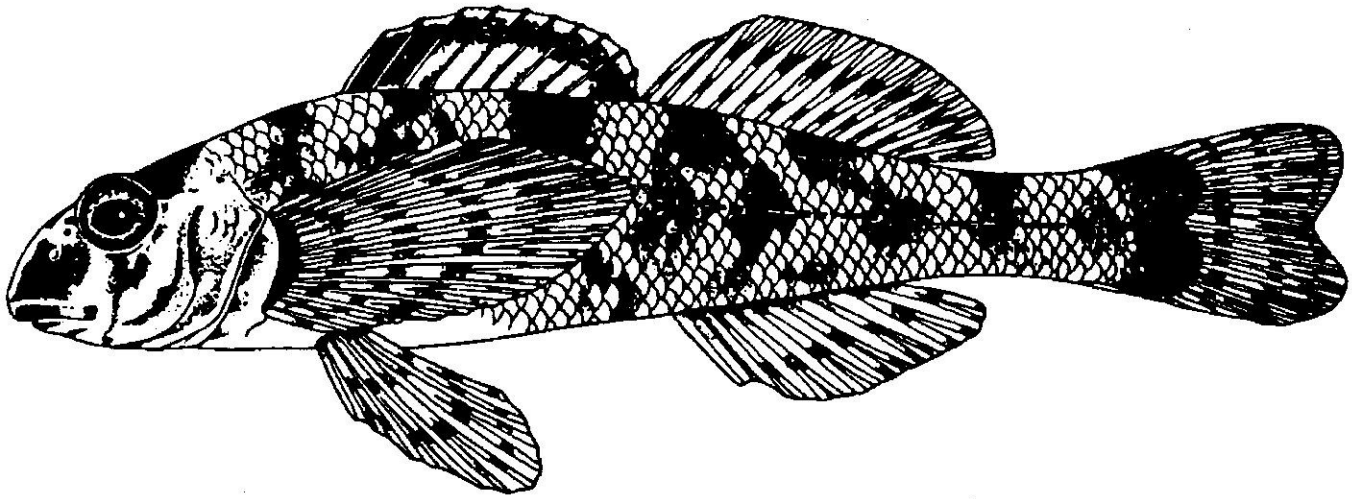
Present Distribution: Harlequin darters are found in scattered localities in tributaries of the lower Mississippi River from southeastern Missouri and western Kentucky south to Louisiana, and in the Gulf Coast drainages from the Florida panhandle to Texas (Page and Burr 1991). Geographically disjunct populations are also known from the Wabash drainage in Illinois and Indiana and the Green River system in Kentucky (Page and Burr 1991). In Illinois this species formerly occurred in a 30 km stretch of the Embarras River in southern Cumberland and northern Jasper counties, where it was extremely rare (Smith 1979). The last observation of the species in the Embarras River was in 1984. Populations of this species have been found recently in the Wabash River in southeastern Illinois. At one site in Wabash County, harlequin darters were found at the river margin in shallow water over sticks and leaves (Retzer, personal communication).

Former Illinois Distribution: The harlequin darter was discovered in Illinois in the Embarras River in 1964. A Wabash River locality (White County) assigned by Forbes and Richardson (1908) to the banded darter (*Etheostoma zonale*) probably was based on the morphologically similar harlequin darter (Smith 1979). The banded darter is not known to occur elsewhere in the Wabash River system. Presumably, the harlequin darter was always rare but once more widespread in the Wabash River system.

Habitat: Harlequin darters live in accumulations of leaves and other plant debris over sand or gravel in clean, clear, moderate to large streams (Hubbs and Pigg 1972).

Reason for Status: Within the short stretch of the Embarras River where this rare darter occurs, it has been found only in low numbers and not since 1984 (Burr 1991). The remaining Illinois population of this darter in the Wabash River is endangered by its limited range, small size, and the potential degradation by siltation and agricultural pollutants.

Management Recommendations: Management needs include a prohibition of dams and channelization and improved soil conservation measures in the Wabash basin to reduce sedimentation (Page 1985b). More intensive surveys need to be conducted to confirm the existence of this species in Illinois.



Etheostoma histrio
(Harlequin Darter)

Fundulus diaphanus (Lesueur)

BANDED KILLIFISH **CYPRINODONTIDAE** **Status:** Threatened in Illinois

Present Distribution: The banded killifish occurs in the Atlantic slope drainage from Newfoundland to South Carolina, Great Lakes and Mississippi River basins from Quebec to Manitoba south to northern Illinois (Page and Burr 1991). In Illinois it is presently restricted to glacial lakes in Cook, Lake and McHenry Counties.

Former Illinois Distribution: Both Nelson (1876a) and Jordan (1878) considered this species to be very abundant in lakes, clear streams, and tributaries in northern Illinois. However, it has now apparently been extirpated from all but a few lakes in northeastern Illinois.

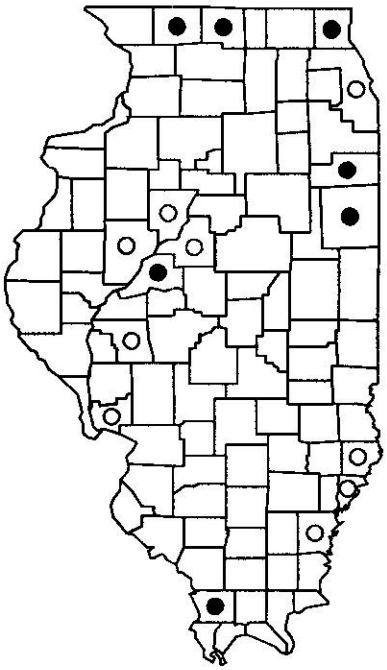
Habitat: In Illinois this species occurs in clear glacial lakes, usually over sand or mud, often near vegetation (O'Donnell 1935, Smith 1979). It is usually found in small schools near the surface of weedy lakes (Smith 1979).

Reason For Status: Reasons for the decline of this species are not well understood but are probably related to destruction and general deterioration of natural lakes and streams in northern Illinois (Smith 1979).

Management Recommendations: Protection of the glacial lakes in northeastern Illinois from development, pollution, and sport fish introductions are the most important management needs of this species in Illinois.

Fundulus dispar (Agassiz)

STARHEAD TOPMINNOW **CYPRINODONTIDAE** **Status:** Threatened in Illinois



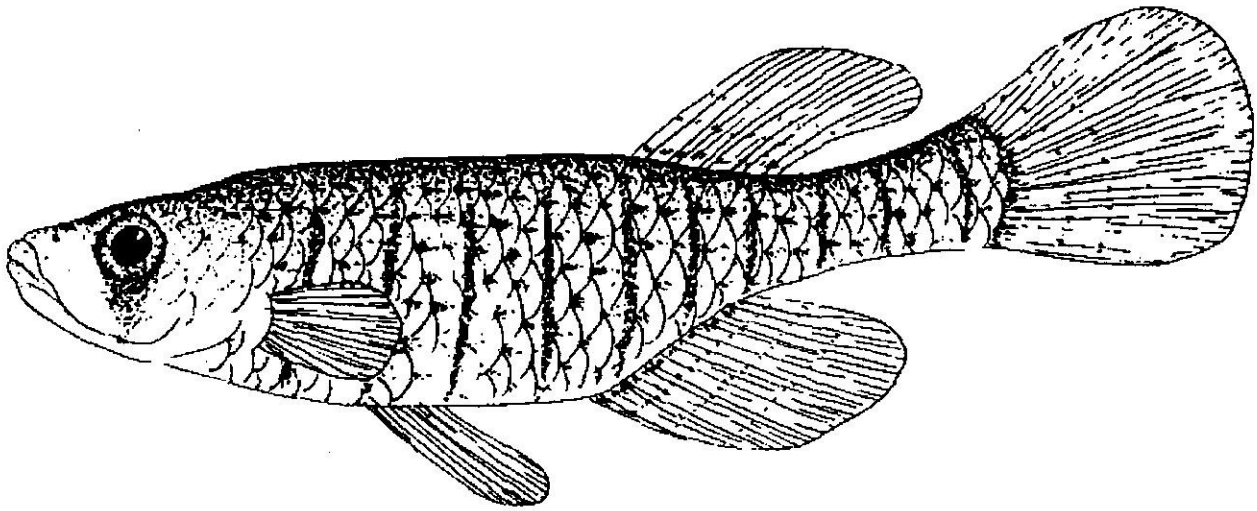
Present Distribution: The northern starhead topminnow occurs in the Mississippi River and Lake Michigan basins south to the Ouachita River drainage of Arkansas and Louisiana (Page and Burr 1991). In Illinois it is most abundant in the northeastern part of the state with single occurrences also in Mason, Union and Winnebago counties.

Former Illinois Distribution: The distribution of the starhead topminnow is extremely sporadic in Illinois but it was often common in those few lakes and swamps were found (Smith 1979). It originally occurred in backwater lakes in the Illinois, Mississippi, and Wabash River drainage's, and the glacial lakes in the northeastern part of the state.

Habitat: In Illinois this species occurs in some glacial lakes, and in clear, well-vegetated floodplain lakes, swamps, and marshes, usually over sand or mud (Smith 1979).

Reason For Status: This species now has a much-reduced distribution in Illinois. The largest known populations are in the glacial lakes of northeastern Illinois. No recent records are known from the Illinois or Wabash River valleys. The disappearance of the starhead topminnow from the Wabash drainage is probably the result of oil pollution and drainage that has eliminated ideal floodplain swamp habitats (Smith 1979).

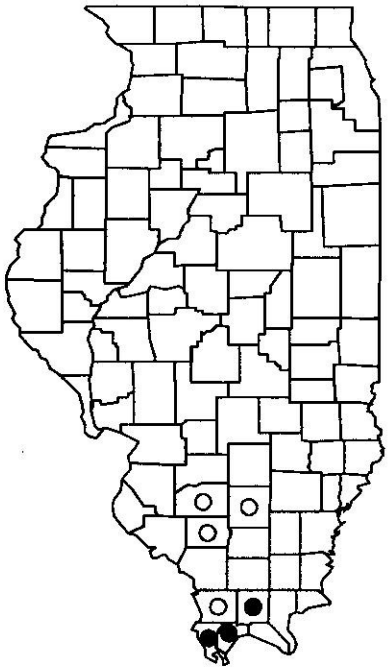
Management Recommendations: Protection of the glacial lakes in northeastern Illinois from development, pollution, and sport fish introductions are the most important management needs of this species in Illinois.



Fundulus dispar
(Starhead Topminnow)

Hybognathus hayi Jordan

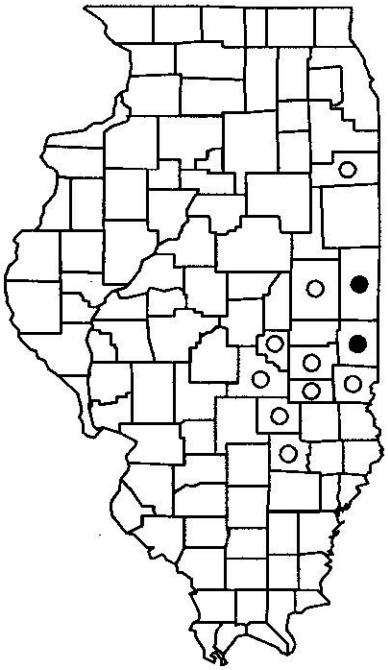
CYPRESS MINNOW **CYPRINIDAE** **Status:** Endangered in Illinois



Present Distribution: The cypress minnow ranges in the Ohio and Mississippi River basins from southwest Indiana and southern Illinois to the Gulf of Mexico, also along Gulf Coast drainages (Page and Burr 1991). The cypress minnow has declined dramatically in abundance in the lower Ohio and lower Mississippi River basins (Warren and Burr 1989). In Illinois this species is apparently restricted to the Cache River and Horseshoe Lake drainage (Warren and Burr 1989).
Former Illinois Distribution: The cypress minnow has always been restricted to southern Illinois, but once also occurred in the Big Muddy River and Clear Creek drainages (Warren and Burr 1989).
Habitat: The cypress minnow is a lowland species inhabiting sluggish backwaters of streams, oxbows and cypress lakes over soft substrates, usually sand, overlain with silt and detritus or mud (Burr and Mayden 1982, Warren and Burr 1989).
Reason For Status: The cypress minnow is disappearing from the northern parts of its range (Page and Burr 1991), and was formerly thought to be extirpated in Illinois (Smith 1979). It was rediscovered in Illinois in 1984, but is known only from Horseshoe Lake, Alexander County, and the Cache River system in Johnson and Pulaski counties (Warren and Burr 1989).
Management Recommendations: Protection from wetland destruction, pollution, and excessive siltation are the primary needs of this species in Illinois (Warren and Burr 1989).

Hybopsis amblops (Rafinesque)

BIGEYE CHUB **CYPRINIDAE** **Status:** Endangered in Illinois



Present Distribution: The bigeye chub is rapidly disappearing from many parts of its range, which within historic times extended from Oklahoma and eastern Kansas northeast to southern Michigan and western New York and south to northern Alabama and Georiga. This species is now extirpated in Kansas (Cross 1967), nearly extirpated from Illinois (Burr 1991), and is declining in much of its northern range, especially in agricultural areas (Page and Burr 1991). In Illinois the bigeye chub was recently found in the Vermilion River and Brouilletts Creek (Page and Retzer 2002).

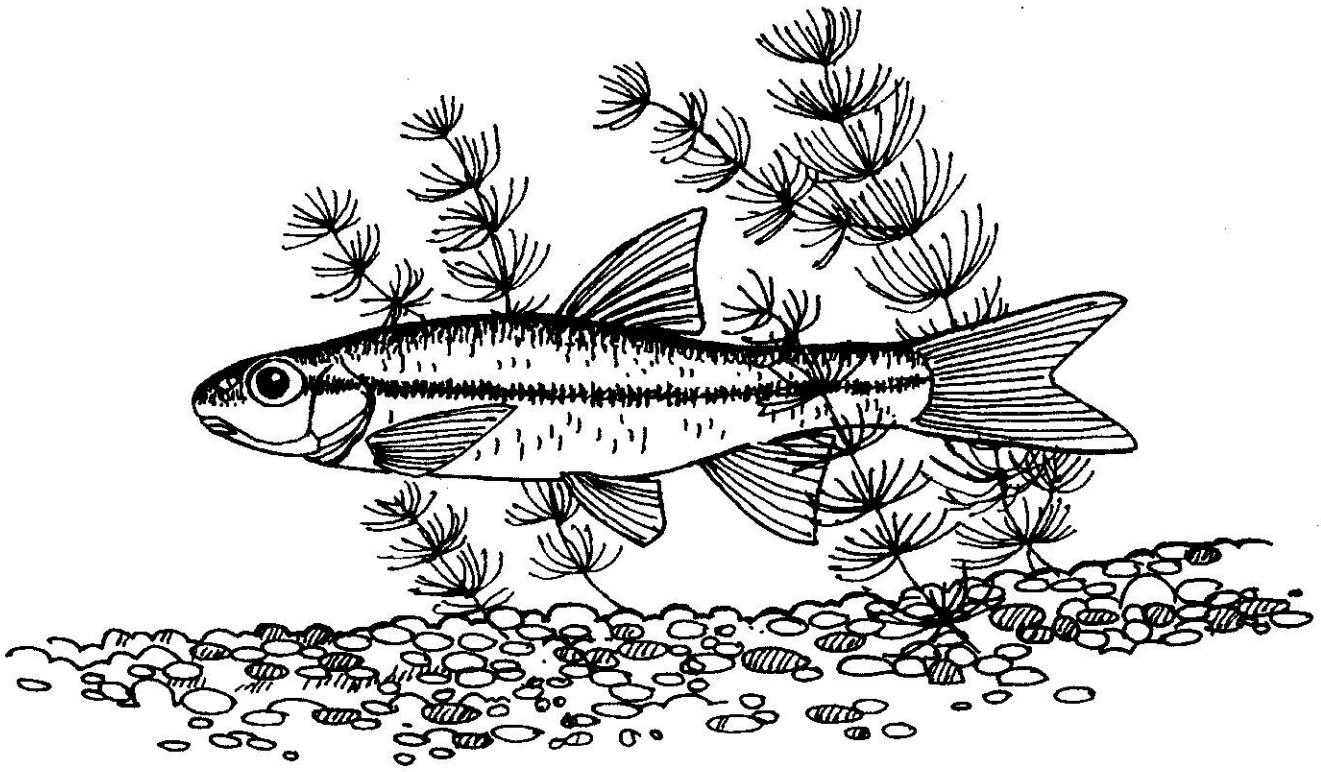
Former Illinois Distribution: The bigeye chub once occurred in the Wabash, Kaskaskia, Vermilion, Embarras, and Little Wabash river systems (Warren and Burr 1988). O'Donnell (1935) described it as abundant in southeastern Illinois.

Habitat: The bigeye chub lives in rocky pools with current, usually occurring near riffles and vegetation (Page and Burr 1991).

Reason for Status: An exceptional intolerance of silt appears to be the most important factor causing the decline of the bigeye chub. The relationship between increased siltation and the decline of the bigeye chub was noted by Trautman (1957) and Smith (1968, 1971, 1979).

Management Recommendations: If high water quality is restored to certain streams in Illinois, particularly the Vermilion, Embarras, and Little Wabash rivers, the bigeye chub would continue to exist in southeastern Illinois.

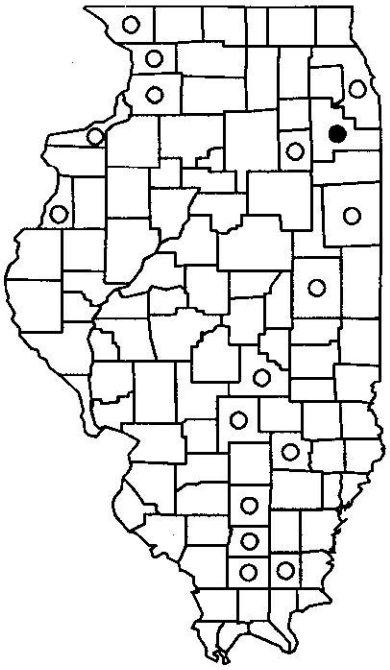
Note: This species is referred to as *Notropis amblops* in previous editions (Herkert 1992).



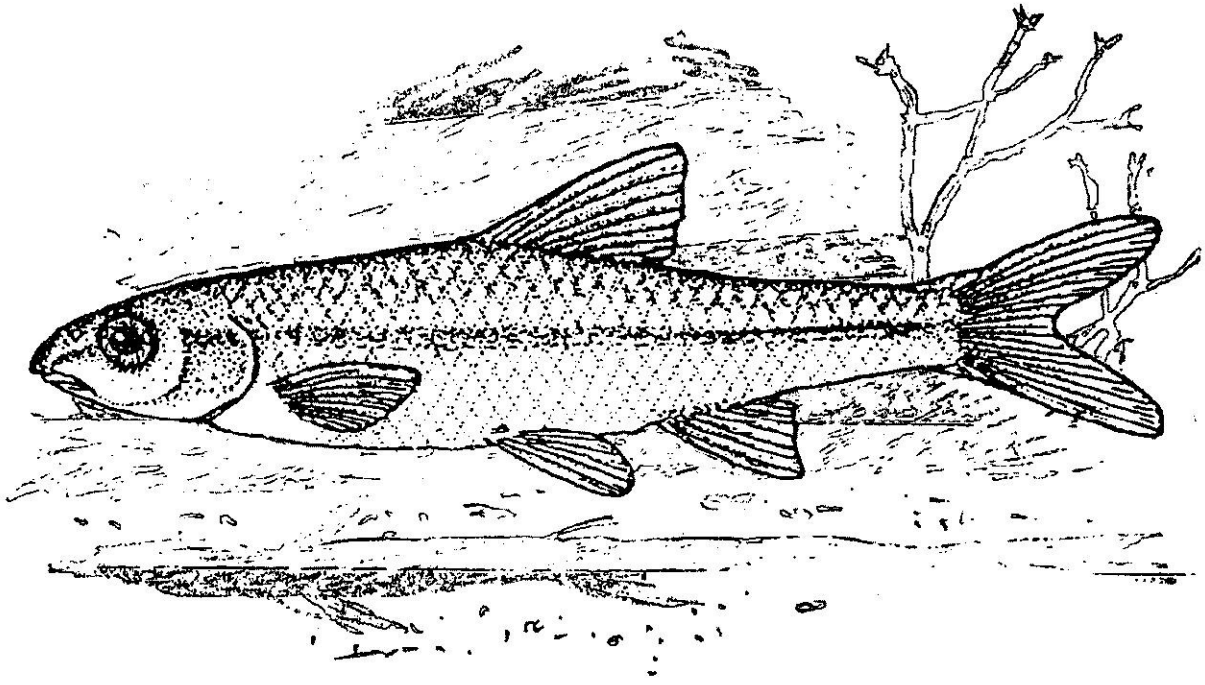
Hybopsis amblops
(Bigeye Chub)

Hybopsis amnis (Hubbs & Greene)

PALLID SHINER **CYPRINIDAE** **Status:** Endangered in Illinois



Present Distribution: The pallid shiner occurs in the Mississippi River basin from Wisconsin and Michigan south to Louisiana, also in Gulf Coast drainages from Louisiana to Texas (Page and Burr 1991). In Illinois it is apparently restricted to the Illinois, Mississippi, and Kankakee rivers (Page and Retzer 2002).
Former Illinois Distribution: The pallid shiner formerly occurred in the Kaskaskia, Little Wabash, Wabash, Saline, Big Muddy and, possibly, in the Mackinaw and Sangamon river systems (Warren and Burr 1989).
Habitat: In Illinois the pallid shiner occurs in pools with negligible current in medium to large rivers having clear water and a sand-silt substrate (Skelly and Sule 1983, Kwak 1991). It is apparently intolerant of excessive siltation and turbidity (Pflieger 1975).
Reason For Status: Pflieger (1975) wrote that no other Missouri fish had exhibited as sharp a decline as the pallid shiner between 1945 and 1975, and listed it as on the verge of elimination within Missouri. In Illinois, Smith (1979) regarded it as nearly extirpated. The reasons for the decline of this species are unknown but probably involve increased siltation from changing land use patterns (Pflieger 1975).
Management Recommendations: Protection from siltation and water control structures are the primary management needs for the pallid shiner in Illinois.
Note: This species is referred to as *Notropis amnis* in previous editions (Herkert 1992).



Hybopsis amnis
(Pallid Shiner)

Ichthyomyzon fossor Reighard & Cummins

NORTHERN BROOK LAMPREY **PETROMYZONTIDAE** **Status:** Endangered in Illinois

Present Distribution: The northern brook lamprey ranges in the St. Lawrence River, from Quebec west through the Great Lakes and northern Mississippi River basins; also local in Ohio River basin of northwest Pennsylvania, western West Virginia, eastern Kentucky, Ohio and northern Indiana, and the Missouri River basin in Missouri (Page and Burr 1991). In Illinois the northern brook lamprey is apparently restricted to the Kankakee River (Page and Retzer 2002).
Former Illinois Distribution: The only Illinois collections of this species are all somewhat recent (1963-1991) records from the Kankakee River in Kankakee County (Page and Retzer 2002).
Habitat: Adult northern brook lampreys occur in clean, clear gravel riffles and runs of small rivers; the larval stage inhabits quiet waters over sand, silt and debris (Page and Burr 1991). Sutton and Bowen (1994) have demonstrated the importance of detritus in the diet of the northern brook lamprey.
Reason For Status: This lamprey has a very restricted range in Illinois and its habitat is threatened by declining water quality.
Management Recommendations: Efforts to protect the Kankakee River from degradation are needed to protect stream faunas and the northern brook lamprey.

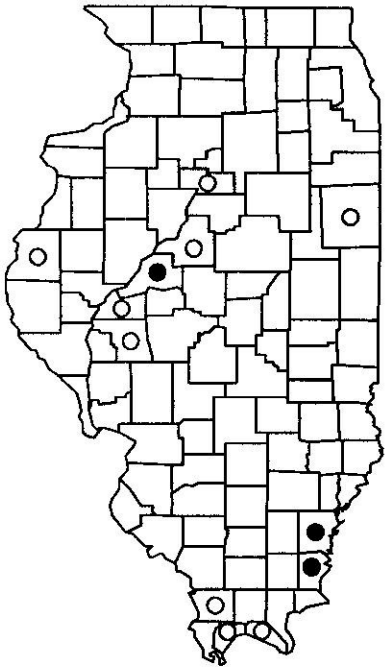
Lampetra aepyptera (Abbott)

LEAST BROOK LAMPREY **PETROMYZONTIDAE** **Status:** Threatened in Illinois

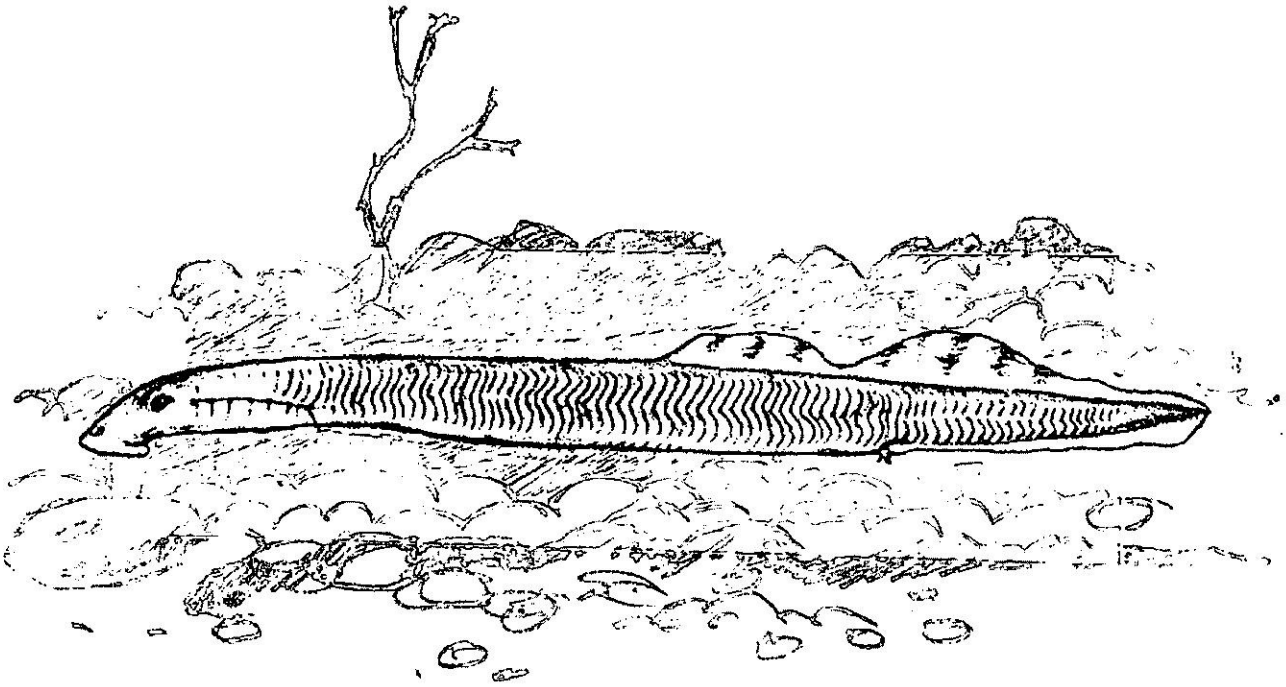
Present Distribution: The least brook lamprey occurs in the Atlantic slope from southeastern Pennsylvania to North Carolina; and in the Mississippi River basin from western Pennsylvania to south-central Missouri and northern Arkansas south to northern Alabama (Page and Burr 1991). In Illinois this lamprey is known from only five creeks in the southern part of the state.
Former Illinois Distribution: The least brook lamprey was first discovered in Illinois in 1956 (Gunning and Lewis 1956). It may have once occurred throughout the eastern portion of the Shawnee Hills of southern Illinois, but has apparently always been rare within the state.
Habitat: Adult least brook lampreys occupy clean, clear, gravelly riffles and runs of creeks and small rivers; the larval stage occurs in spring-fed wetlands, quiet pools, and backwaters of small sand or mud bottom streams (Page and Burr 1991). Sex ratios for this species may be density dependent, and detritus could be a major food source for larvae (Docker and Beamish 1994, Sutton and Bowen 1994).
Reason For Status: The least brook lamprey is known to occur at few locations in the state and is dependent on clean, clear water.
Management Recommendations: Protection from impoundments and siltation in streams known to support this species is needed in order to insure the continued existence of this lamprey in Illinois.

Lepomis miniatus Forbes and Richardson

REDSPOTTED SUNFISH **CENTRARCHIDAE** **Status:** Threatened in Illinois



Present Distribution: A species of the Mississippi River valley and its major tributaries, the redspotted sunfish ranges from Illinois to Texas and Louisiana. This species is presently found in only a few bottomland lakes, swamps, and sluggish ditches along the middle Illinois River valley and in the southern part of the state in the Ohio, Wabash, Little Wabash, Illinois, Cache and Mississippi rivers (Smith 1979).
Former Illinois Distribution: Although never abundant in Illinois, the redspotted sunfish was once more widespread than at present. It is now known from a few bottomland lakes in Mason, White, and Gallatin counties in Illinois.
Habitat: This sunfish occurs in shallow water of swamps, bottomland lakes, and sluggish ditches, usually over mud or sand, in association with dense beds of vegetation (Warren 1989, Page and Burr 1991).
Reason For Status: The decline of the redspotted sunfish in Illinois is probably the result of the drainage of swamps, bottomland lakes, and the general deterioration of water quality. In the lower Wabash River, oil pollution is a possible reason for the species decline (Smith 1979).
Management Recommendations: Increased protection of swamp, slough and lake habitats are essential to adequately protect this species in Illinois.
Note: Page and Burr (1991) considers this entity to be a subspecies of *Lepomis punctatus*.

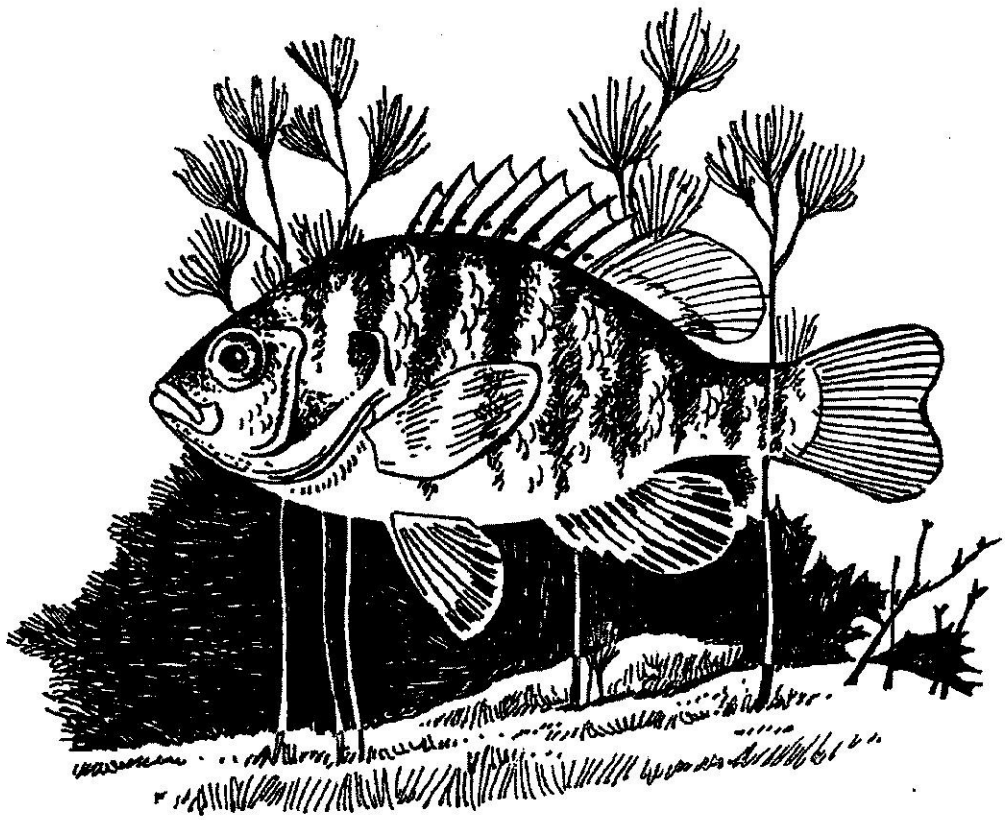


Lampetra aepyptera
(Least Brook Lamprey)

Lepomis symmetricus Forbes

BANTAM SUNFISH **CENTRARCHIDAE** **Status:** Threatened in Illinois

Present Distribution: Primarily restricted to the Gulf Coastal Plain, the bantam sunfish ranges from southern Illinois to Texas and Louisiana (Burr 1977). The species is common in the southern part of its range, but in Illinois it presently occurs only from the Pine Hills area south through the Clear Creek drainage to Horseshoe Lake (Burr *et al.* 1988).
Former Illinois Distribution: The bantam sunfish was first described from specimens collected in 1880 from Pekin, Tazewell County (Burr 1977). The species also formerly occurred in backwater ponds and sloughs of the Wabash River in White County.
Habitat: This sunfish lives in swamps and mud-bottomed, heavily vegetated ponds, lakes, and sloughs (Page and Burr 1991).
Reason for Status: The species disappeared for unknown reasons from Tazewell and White counties near the turn of the century. The Union County populations are on the edge of this sunfish's present range, and this region may provide the only remaining suitable habitat for the species in Illinois.
Management Recommendations: The population in Pine Hills Swamp was protected by the establishment of the LaRue-Pine Hills Ecological Area, and the north end of Wolf Lake is now part of Shawnee National Forest and is protected from exploitation. However, complete protection of Wolf Lake from accidental chemical discharges, spills and other forms of pollution are necessary to protect the unusual animals in the lake.



Lepomis symmetricus
(Bantam Sunfish)