Illinois Fishes

Volume I

Photo © 2010, T. Lawrence, Great Lakes Fishery Commission

detail of sea lamprey's oral disc

sea lamprey attached to lake trout *Salvelinus namaycush* — ***Petromyzon marinus***

Photo © 2010, Great Lakes Fishery Commission

chestnut lamprey — ***Ichthyomyzon castaneus***

Photo © 2010, Philip Willink/The Field Museum of Natural History, Chicago

northern brook lamprey — ***Ichthyomyzon fossor***

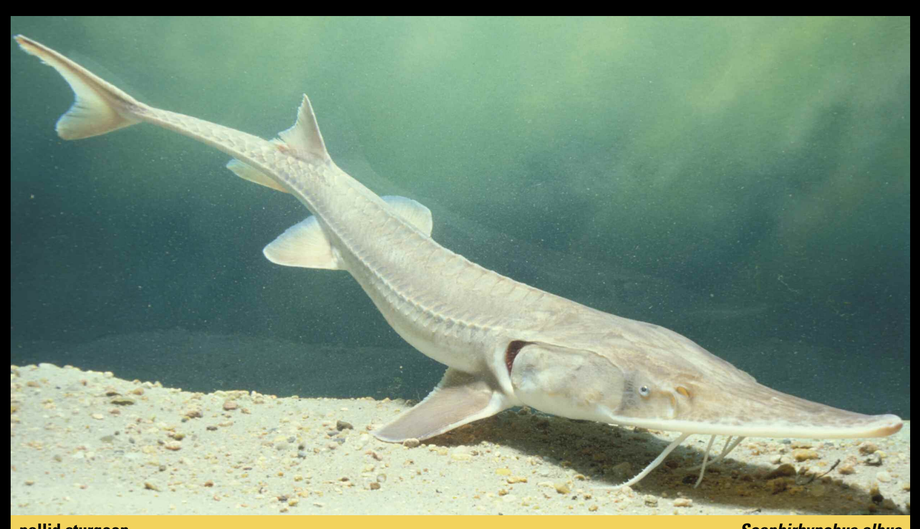
Photo © 2010, Philip Willink/The Field Museum of Natural History, Chicago

American brook lamprey — ***Lampetra lamottei***

Photo © 2010, Philip Willink/The Field Museum of Natural History, Chicago

shovelnose sturgeon — ***Scaphirhynchus platorynchus***

Photo © 2010, Shedd Aquarium



pallid sturgeon — ***Scaphirhynchus albus***

Photo © 2010, NEBRASKAland Magazine/Nebraska Game and Parks Commission

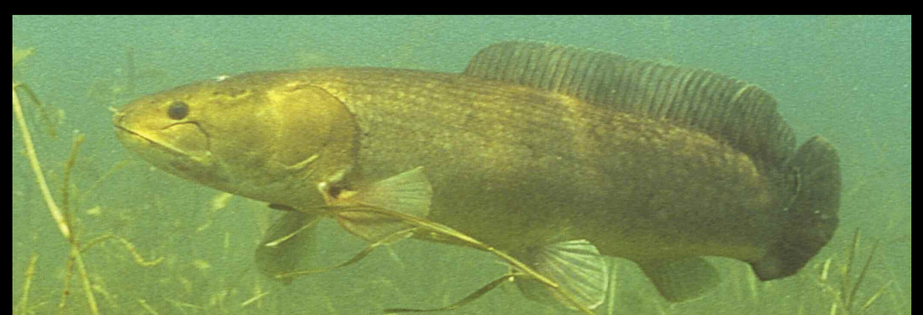
detail of silver lamprey's oral disc

silver lamprey — ***Ichthyomyzon unicuspis***

Photo © 2010, Shedd Aquarium

least brook lamprey — ***Lampetra aepyptera***

Photo © 2010, Julie Zimmerman



bowfin — ***Amia calva***

Photo © 2010, Engbretson Underwater Photography

American eel — ***Anguilla rostrata***

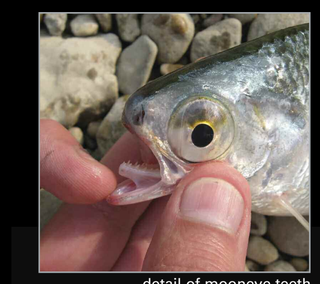
Photo © 2010, Engbretson Underwater Photography

shortnose gar — ***Lepisosteus platostomus***

Photo © 2010, Uland Thomas

longnose gar — ***Lepisosteus osseus***

Photo © 2010, Engbretson Underwater Photography



detail of mooneye teeth

mooneye — ***Hiodon tergisus***

Photos © 2010, Uland Thomas

goldeye — ***Hiodon alosoides***

Photo © 2010, Shedd Aquarium

Alabama shad — ***Alosa alabamae***

Photo © 2010, Patrick O'Neil, Geological Survey of Alabama

skipjack herring — ***Alosa chrysochloris***

Photo © 2010, Patrick O'Neil, Geological Survey of Alabama

alewife — ***Alosa pseudoharengus***

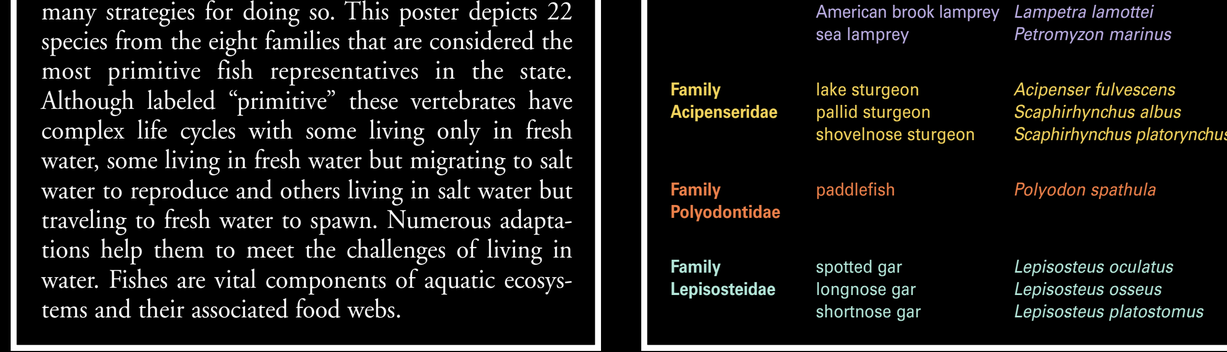
Photo © 2010, Engbretson Underwater Photography

gizzard shad — ***Dorosoma cepedianum***

Photo © 2010, Shedd Aquarium

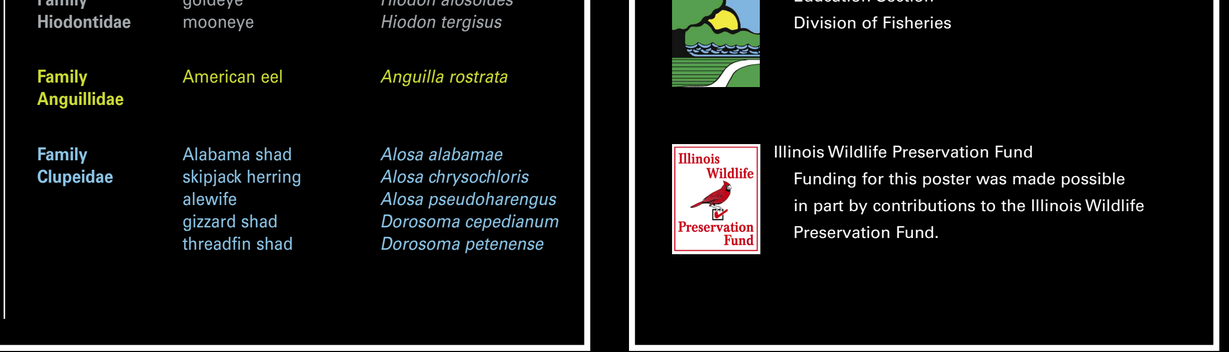
threadfin shad — ***Dorosoma petenense***

Photo © 2010, Uland Thomas



lake sturgeon — ***Acipenser fulvescens***

Photo © 2010, Engbretson Underwater Photography



paddlefish — ***Polyodon spathula***

Photo © 2010, Engbretson Underwater Photography

spotted gar — ***Lepisosteus oculatus***

Photo © 2010, Uland Thomas

Approximately 22,000 fish species inhabit the earth, with about 790 species found in the fresh waters of the United States and Canada. More than 200 fish species are known from Illinois' aquatic habitats. The large variety of species means that fishes occupy almost all available aquatic habitats and have many strategies for doing so. This poster depicts 22 species from the eight families that are considered the most primitive fish representatives in the state. Although labeled "primitive" these vertebrates have complex life cycles with some living only in fresh water, some living in fresh water but migrating to salt water to reproduce and others living in salt water but traveling to fresh water to spawn. Numerous adaptations help them to meet the challenges of living in water. Fishes are vital components of aquatic ecosystems and their associated food webs.

Species List

Species are not shown in proportion to actual size.

Kingdom Animalia Phylum Chordata

Family Petromyzontidae	chestnut lamprey	*Ichthyomyzon castaneus*
	northern brook lamprey	*Ichthyomyzon fossor*
	silver lamprey	*Ichthyomyzon unicuspis*
	least brook lamprey	*Lampetra aepyptera*
	American brook lamprey	*Lampetra lamottei*
	sea lamprey	*Petromyzon marinus*
Family Acipenseridae	lake sturgeon	*Acipenser fulvescens*
	pallid sturgeon	*Scaphirhynchus albus*
	shovelnose sturgeon	*Scaphirhynchus platorynchus*
Family Polyodontidae	paddlefish	*Polyodon spathula*
Family Lepisosteidae	spotted gar	*Lepisosteus oculatus*
	longnose gar	*Lepisosteus osseus*
	shortnose gar	*Lepisosteus platostomus*
Family Amiidae	bowfin	*Amia calva*
Family Hiodontidae	goldeye	*Hiodon alosoides*
	mooneye	*Hiodon tergisus*
Family Anguillidae	American eel	*Anguilla rostrata*
Family Clupeidae	Alabama shad	*Alosa alabamae*
	skipjack herring	*Alosa chrysochloris*
	alewife	*Alosa pseudoharengus*
	gizzard shad	*Dorosoma cepedianum*
	threadfin shad	*Dorosoma petenense*

This poster was made possible by:

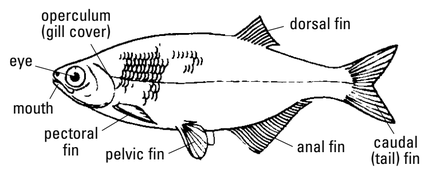
Illinois Department of Natural Resources
Education Section
Division of Fisheries

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

Illinois Fishes Volume I

Structure

Fishes are vertebrates that breathe through gills. They have fins, and most are covered with scales. They live in water, a very demanding medium, and sometimes they live in water that flows, requiring additional adaptations. In general, fishes are streamlined to help them move through the water column with the least resistance. If they live on the bottom of streams, the bottom of their body may be flat, an adaptation that helps them avoid being washed away by the current. If their body is cylindrical they may be able to hide in rocks or crevices.



Water provides support for aquatic organisms, so large, complex limbs are not needed to overcome the effects of gravity. Fishes use fins to help them move, steer the body, provide stability, function as brakes and maintain position in the water. There are single (dorsal, caudal, adipose, anal) and paired fins (pectoral, pelvic). The swim bladder is a gas-filled internal organ that can be adjusted so that the fish's density is equal to that of the water, in effect allowing it to suspend itself effortlessly in the water column. Fishes that live on the bottom may not have a swim bladder.

Most fishes have scales. Some primitive fishes, like sturgeons and gars, have hard scales that do not overlap. The majority of fish species have thin scales that overlap. Other fishes have no scales but have a tough, leathery skin for protection. A film of mucus is secreted by the skin of all fishes. The mucus helps decrease resistance with the water column as the fish swims and helps to maintain the internal salt balance of the fish.

Gills are located on each side of and behind the head. The gills of most fishes are covered by a bony flap, the gill cover. A gill has a hard gill arch with many fleshy gill filaments, each loaded with blood vessels. As water is forced over the gills, oxygen is removed from the water at the filaments, and carbon dioxide is released into the water. Gill filaments are very fragile and can be easily damaged.

Fishes can see, but depending on the clarity of the water, the sense of sight may not be of much value to them. They have an inner ear for hearing and for aiding with equilibrium in the water. The sense of smell is acute and used for finding food, recognition of locations, homing, migration and finding a mate. Most fishes have a lateral line, a series of open-ended tubes along the sides. The lateral line system detects moving and fixed objects in the water and helps supplement the other senses.

Life History

With about 22,000 types of fishes in the world, there is great variety in their life history. Some commonalities do exist, although there are always exceptions. This section will discuss the general life history of the fishes depicted on this poster with some specific examples provided.

Most fishes have external fertilization. The sperm and eggs are released at approximately the same time in close proximity. The water keeps the eggs moist and allows sperm to swim to them. Mating in fishes is known as spawning. Most Illinois fishes spawn in spring and summer. Spawning may be accompanied by a migration. Depending on the species, eggs may sink or be carried by the current, attach to vegetation, gravel or rocks, be deposited in a hollow log or be placed in a "nest" that has been cleared on the bottom. Parental care varies from none to defending the eggs and newly hatched young for a short time. Generally, the greatest numbers of eggs are produced by the species with the least parental care. Eggs hatch within a few days. Newly hatched young feed on a supply of stored yolk until they can obtain food on their own. Fishes have the potential to grow throughout their life and to live for many years.

The examples below provide details of some specific life cycles of fishes represented on this poster.

Lampreys – Lampreys have both a larval and an adult stage. The ammocoete is the blind, larval form that hatches from the fertilized egg. It burrows tail first into the bottom of the small stream where it hatched leaving only the head sticking out to filter microscopic organisms that pass by. It transforms to the adult after several years. There are two types of adult lampreys. Some species are parasitic on fishes. Other species do not feed as adults. The parasitic lamprey adult leaves the small stream and swims to a larger river or lake. It uses its oral disc to attach to a fish and scrape a hole in the body through which it sucks blood and tissue fluids. After feeding in this manner for several days, the lamprey drops off. The host fish is generally not killed directly but may die due to infections that invade through the wound. Parasitic lampreys feed in this manner for one to two years before migrating to small streams to spawn. Spawning usually involves many lampreys at the same location. In those species that are not parasitic, the adults remain in the small stream after transforming from the larval stage. They do not feed and die soon after spawning the next spring.

American eel *Anguilla rostrata* American eel adults spend five to 20 years in fresh water before migrating to the sea to breed. Males tend to stay near the coast, while females travel far inland until their movement is blocked by a dam or other object. Any eel found naturally in Illinois is a female. The eggs are laid in the Sargasso Sea of the Atlantic Ocean near Cuba. Larval eels live in the ocean for about a year before transforming to the elver stage and traveling to fresh water.

Alabama shad *Alosa alabamae* The Alabama shad lives most of its adult life in salt water, coming to fresh water only to reproduce. Adults are present in the Mississippi River drainage system from April through July but at no other time. Young are present only during late summer and early fall. Adults do not feed while in fresh water, but the young eat insects and fishes.

Species Descriptions

Family Petromyzontidae — Lampreys are jawless fishes with a cartilaginous skeleton, cylindrical body and no scales. They have an oral sucking disc, seven gill openings along each side and a single nostril. They do not have paired fins. These fishes have an adult and a larval (ammocoete) form.

American brook lamprey *Lampetra lamottei*
The adult (average length: 6-8") of this species is gray to black on the back and upper sides and tan to gray-white below. When expanded, the oral disc is narrower than the head, and its teeth are arranged in clusters. The American brook lamprey may be found primarily in the northeastern one-fourth of Illinois. The adult lives in fast riffles of creeks and rivers with clear water. The ammocoete lives in sandy or silty pools. Adults do not feed and die soon after spawning. The larva takes five years or more to complete development.

chestnut lamprey *Ichthyomyzon castaneus*
The chestnut lamprey (average length: 10-12") lives in rivers of Illinois, except in the northeastern one-fourth of the state. The adult's mouth when expanded is equal to or wider than the head. The body is yellow or tan. Adults move into streams to spawn in late winter and spring. The ammocoete stage lasts three to six years. The adult may live about 18 months, but it feeds for only about five months midway through its life span. The adult is parasitic on fishes.

least brook lamprey *Lampetra aepyptera*
This fish has a notch in the dorsal fin that separates it into two sections. When expanded, the oral disc is not as wide as the head. The teeth of this species are very small. The body is tan with dark brown spots above and yellow-white below. The larval form takes three years to complete development. This fish (average length: 3-5") lives in gravel riffles in streams and small rivers with clear water. In Illinois, it is considered threatened, living in only a few creeks in the southeastern part of the state.

northern brook lamprey *Ichthyomyzon fossor*
The adult of this species (average length: 7") is dark brown. When expanded, its oral disc is narrower than the head. This fish prefers to live in gravel riffles and runs in small rivers with clear water. In Illinois, it is restricted to the Kankakee River and is an endangered species. The ammocoete stage lasts about four years. After transformation, the adult swims a short distance upstream into gravel-bottomed creeks to spawn and die.

sea lamprey *Petromyzon marinus*
The sea lamprey (average length: 14-19") is blue-gray to olive-brown with black mottling. Its oral disc is as wide as or wider than the head. The larval form lives in streams for about seven years before transforming to the adult stage. The adult lamprey swims to Lake Michigan where it is a parasite of large fishes for about one and one-half years before returning to a stream to spawn and die. This fish is native to the Atlantic Ocean and Lake Ontario, and usually lives in the ocean and spawns in fresh water. The sea lamprey was able to enter inland waters with the building of the Welland Canal. The first sea lamprey was found in Lake Michigan in 1936. This animal severely decimated populations of lake trout (*Salvelinus namaycush*) and whitefish (*Coregonus clupeaformis*) in Lake Michigan in the 1940s and 1950s. In the 1960s a chemical (TFM) was developed and used to kill the larval forms in streams, bringing the population under control.

silver lamprey *Ichthyomyzon unicuspis*
When held open, the silver lamprey's oral disc is wider than its head. Larvae are yellow while adults are blue to black. The silver lamprey lives in the Mississippi, Illinois, Kaskaskia, Ohio and Wabash rivers in Illinois and spawns in medium-sized streams with sand and gravel riffles. Larval development takes four to seven years. The adult lives for about one year. The adult (average length: 15") is an external parasite of fishes.

Family Acipenseridae — The sturgeons have a shovel-shaped snout with four barbels on the lower surface. The body is covered with several rows of bony plates. The upper lobe of the tail fin is longer than the lower lobe.

lake sturgeon *Acipenser fulvescens*
This fish inhabits large rivers and lakes that are deep and have mud, sand or gravel on the bottom. The slate, light brown or yellow-green body is covered with bony plates. The lake sturgeon may reach eight feet in length and over 300 pounds in weight, but growth is very slow. Maturity is reached at about age 20 years. Lake sturgeons commonly live 40 years and have been known to live more than 150 years. This fish spawns in late spring, swimming up small streams to do so. The female does not reproduce each year. It feeds on the bottom using its extendible mouth to suck up small invertebrates. In Illinois, the lake sturgeon is an endangered species and can be found in the Rock, Mississippi and Ohio rivers and Lake Michigan.

pallid sturgeon *Scaphirhynchus albus*
The pallid sturgeon is endangered in Illinois as well as federally. In Illinois, it is found in the Mississippi River south of its confluence with the Missouri River. It prefers large, deep river channels in strong current over gravel or sand substrate. The maximum length for this species is about six feet, although most individuals are much shorter and their average weight is less than 10 pounds. The back and sides of this species are gray-white while the belly is white. It feeds on fishes and aquatic invertebrates. Males reach maturity at five to seven years of age, while females spawn for the first time at 15 to 20 years of age. Females do not reproduce each year.

shovelnose sturgeon *Scaphirhynchus platorynchus*
The shovelnose sturgeon's body is brown on the back and sides with a white belly. This fish is able to reproduce when it reaches a length of 20 to 25 inches (age five to seven years). Eggs are deposited over a gravel or rock bottom in the open channel of a large river. Spawning occurs April through June. The shovelnose sturgeon eats insect larvae. In Illinois, it lives in the Mississippi, Illinois, Ohio, Wabash and Rock rivers where it attains an average weight of one and one-half to two pounds.

Family Polyodontidae — Paddlefishes have a long snout that is shaped like a canoe paddle. There are two barbels on the snout's lower surface and no bony plates on the body. There are no scales except for a patch on the upper lobe of the forked tail.

paddlefish *Polyodon spathula*
Although its average weight is two pounds, the paddlefish may reach 160 pounds in weight, seven feet in length and may live 20 to 30 years. The body is gray to blue-gray on the back and sides with a white belly. The paddlefish lives in large rivers, preferring slow-moving water over four feet deep. For spawning it requires a large, free-flowing river with gravel bars that will remain flooded for the duration of the spring spawning period. This fish swims continuously in open water and may swim hundreds of miles. It reaches maturity at age seven. Spawning occurs in April and May. Eggs are sticky and attach to objects on the bottom. The paddlefish feeds on microscopic crustaceans and insect larvae it filters from the water. In Illinois, it lives in the Mississippi, Illinois, Ohio and Wabash rivers.

Family Lepisosteidae — Gars have a cylindrical body covered with diamond-shaped scales. Their long snout has sharp teeth. The dorsal and anal fins are positioned near the tail. The swim bladder may be used for breathing when the oxygen content in the water is very low.

longnose gar *Lepisosteus osseus*
The longnose gar (average length: 3-5') may be found statewide in Illinois. Females are larger than males. The back is olive-brown with the color gradually shading to white on the belly. Dark spots may be seen on the dorsal, anal and tail fins. It lives in large rivers and lakes, usually near aquatic plants. Spawning occurs from May through June. The adults move into small streams to spawn in gravel riffles. Large numbers of adults may be present at the spawning site, and their movement mixes the eggs into the gravel. The longnose gar eats fishes.

shortnose gar *Lepisosteus platostomus*
The shortnose gar may grow to 31 inches in length and three and one-half pounds in weight. Its snout is about one-half the length of the entire head. The body color is olive or brown on the back and sides with a white belly. There are black spots on the dorsal and caudal fins. In the water, it is found near aquatic plants and submerged logs. This fish reaches maturity at a length of 15 inches (three years old). Spawning occurs May through July. The female scatters eggs over aquatic plants and other objects in shallow water. The shortnose gar eats insects, crayfish and fishes. In Illinois, it lives in the Mississippi, Illinois, Ohio and Wabash rivers.

spotted gar *Lepisosteus oculatus*
The spotted gar may grow to about three feet in length. It has black spots on its fins and the top of its head. Its back is brown or olive, gradually shading along the sides to white on the belly. Males reach maturity at two to three years of age while females become mature at three to four years. The spotted gar may be found in the Mississippi, Illinois, Ohio, Wabash and Kaskaskia rivers and the swamps and sloughs in the southern tip of Illinois. It frequents areas with many aquatic plants and/or trees in the water. Spawning occurs in spring. This fish mainly eats other fishes but will take crayfish, freshwater shrimp and insects.

Family Amiidae — The bowfin has round scales and a bony plate under the jaws. The upper and lower regions of the tail are equal in size. Only one species remains in this family, the bowfin of the eastern United States.

bowfin *Amia calva*
The average size for a bowfin is two pounds and 15 to 27 inches in length. Small tubular nostrils are present on the upper lip, and there is a large, dark spot on the upper tail fin. The body is long and cylindrical with the dorsal fin extending more than half the length of the back. The large mouth has many teeth. The pectoral, pelvic and tail fins are rounded. The dorsal and tail fins have black bands. The body is olive-green with a yellow or pale-green belly. The bowfin lives in swamps, sloughs and streams statewide and natural lakes in northeastern Illinois. This fish is active at night. It reaches maturity at two to three years of age. Spawning occurs from April through June. Eggs are placed in a nest constructed by the male on the bottom. The male bites, rubs and fans silt and plants away from the site. These actions leave a bed of roots, sand or gravel for the eggs to attach to. The male guards the eggs and young until they reach about four inches in length. The bowfin eats fishes and crayfish.

Family Hiodontidae — Mooneyes are North American fishes. Their body is silvery and flat-sided. The large eyes are a prominent feature. Teeth are present on the jaws, roof of the mouth and tongue. The midline of the belly is keeled. Smooth-edged scales cover the body but not the head. The eggs are somewhat buoyant and float downstream with the current.

goldeye *Hiodon alosoides*
The goldeye (average length: 14-16") has a white-silver body that is compressed side to side and an iris of the eye that is golden-colored. The front edge of the dorsal fin is located behind the front edge of the anal fin. Unlike the similar mooneye, the fleshy keel extends along the belly from the anus to the pectoral fin base. The goldeye may be found statewide in Illinois except in the northeastern one-fourth of the state. It lives in large- and medium-sized rivers with a good current and prefers areas over a sand bottom. Spawning occurs in spring. The goldeye reaches maturity in its third year. This fish eats insects, crustaceans and fishes. It feeds at dusk or at night at the water's surface.

mooneye *Hiodon tergisus*
The mooneye is similar in appearance to the goldeye, although smaller in size, and can be separated from it by these features: the front of the dorsal fin base precedes the front of the anal fin base; the fleshy keel is only present from the anus to the pelvic fin bases; and the eyes are larger. The mooneye lives in large streams and rivers statewide in Illinois. It feeds near the surface, eating insects and small fishes. It is most active at dusk.

Family Anguillidae — Eels have a long, cylindrical body. Their dorsal, caudal and anal fins are connected into one long fin. The anus is directly in front of the anal fin. Most eels live in fresh water and spawn in the ocean.

American eel *Anguilla rostrata*
The American eel grows to a maximum length of 60 inches. Its average size is two and one-half pounds in weight and 16 to 33 inches in length. The female is larger than the male. The body is snakelike with no pelvic fins. The head is pointed, and the lower jaw extends beyond the upper jaw. The body is yellow or brown on the back and sides with a yellow or white belly. The scales are tiny. The adults live in permanent streams and are active at night. Adults spend five to 20 years in fresh water before returning to the sea to breed. Larval eels live in the ocean for about a year before transforming and migrating to fresh water. Adults eat fishes and scavenge.

Family Clupeidae — The herrings and shads have a sawtooth keel on the belly. Their silvery scales, dorsal fin positioned far in front of the anal fin and absence of a lateral line are also characteristic features. They have an adipose eyelid, a clear membrane that partially covers the eye.

Alabama shad *Alosa alabamae*
This species lives most of its adult life in salt water, coming to fresh water only to reproduce. Adults are present in the Mississippi River drainage system from April through July but at no other time. Young are present only during late summer and early fall. Adults do not feed while in fresh water, but the young eat insects and fishes. The upper back of this fish is blue or green with silver reflections. The sides and belly are white. There is a single row of teeth on the tongue, and the lower jaw has dark pigmentation along its length.

alewife *Alosa pseudoharengus*
The alewife (average length: 6-7") is not native to Lake Michigan but moved through the Great Lakes after the opening of the Welland Canal, a bypass around Niagara Falls. The species arrived in Lake Michigan in 1949. It is blue-green on the back with silver-white sides and belly. The eyes are large and prominent. Alewives spawn in April through June. This species normally lives in the ocean, and cold winter conditions in the Midwest often result in spring die-offs with thousands of these dead fish washing up on the shore. Adults feed on zooplankton, insects and larval fishes. Alewife populations rapidly expanded in Lake Michigan in the mid-1950s after the population of their main predator, the lake trout, declined. At times, 80 percent of the biomass (weight) of fishes in Lake Michigan was composed of alewives. A program to stock salmon in the Great Lakes was initiated in the 1960s. Salmon are predators of alewives.

gizzard shad *Dorosoma cepedianum*
The gizzard shad (average length: 9-14") has a small mouth and a long slender projection from the back of the dorsal fin. The upper jaw projects further than the lower jaw and has a notch in its center. The back is silver-blue that shades to silver-white on the sides and belly. The upper sides have horizontal dark streaks. A large purple spot is present behind the upper end of the gill opening. This species can be found statewide in Illinois, including Lake Michigan, inhabiting large rivers, lakes and reservoirs. Gizzard shad swim in schools. They feed on algae, insect larvae and organic debris. Spawning occurs in April and May, with the sticky eggs attaching to the bottom. The young shad are a valuable food source for many sport fishes.

skipjack herring *Alosa chrysochloris*
The lower jaw of this fish projects further than the upper jaw. The dark pigment on the lower jaw is only at the tip. The teeth on the tongue are present in two to four rows. The skipjack herring (average length: 12-16") is blue or green on the back with silver-white sides and belly. It lives in large rivers and other waters where its movements are not impeded by dams and large reservoirs. It does not tolerate high turbidity in the water. Skipjack herring move continually in schools. Small fishes comprise the diet.

threadfin shad *Dorosoma petenense*
Threadfin shad (average length: 4-5") may be found in Illinois in the Ohio River and the Mississippi River south of St. Louis. Their appearance is similar to that of the gizzard shad, but the upper jaw does not project beyond the lower jaw, and there is black pigment on the chin and floor of the mouth. The back is silver-blue that shades to silver-white on the sides and belly. The fins, except the dorsal fin, contain much yellow coloration. Food, such as algae and plankton, is filtered from the water. Spawning occurs from April through June. Those young hatched early in the spawning season may reproduce later in the summer.

Conservation

Fishes face tremendous survival challenges, with most of them imposed by humans. Degradation of their habitat by silt, turbidity, chemical pollution, increased temperature and decreased oxygen supplies due to vegetation removal, construction of dams and other barriers and removal of water from natural sources are just some of the problems to be overcome. The picture does not have to be bleak, however. Humans can take positive actions to improve water quality and to permit the migration of fish species all along waterways.

As of 2009, the Illinois Endangered Species Protection Board lists 19 species of fishes as endangered in the state and 12 species as threatened. Of the 22 species depicted on this poster, three are endangered and one is threatened.

Endangered: lake sturgeon *Acipenser fulvescens* This species has lost its ability to reach upstream spawning areas because of the construction of dams and the destruction of spawning areas through channelization, siltation, impoundment and pollution. Over fishing in the late 1800s and early 1900s contributed to the problem, too, as does the fact that the female does not reproduce until she is about 20 years old. Restoration of clean water and restrictions on stream modifications are necessary to insure the species' survival.

Endangered: pallid sturgeon *Scaphirhynchus albus* Pallid sturgeon populations are threatened by habitat degradation, poor reproduction success, over harvesting and hybridization with the shovelnose sturgeon (*Scaphirhynchus platorynchus*). Protection of all individuals of this species and their habitats is necessary for survival.

Endangered: northern brook lamprey *Ichthyomyzon fossor* This species prefers to live in gravel riffles and runs in small rivers with clear water and in Illinois is restricted to the Kankakee River. The small area that it occupies is threatened with declining water quality. Improving the water quality of the Kankakee River will aid this species as well as all other flora and fauna of the Kankakee River.

Threatened: least brook lamprey *Lampetra aepyptera* The least brook lamprey lives in gravel riffles in streams and small rivers with clean, clear water. Those habitats are somewhat rare in the state. In Illinois, it lives in only a few creeks in the southeastern part of the state. Protection from habitat degradation is necessary for the species to survive.

References

Burr, B. M. 1997. *Annotated checklist of Illinois fishes*. Southern Illinois University, Carbondale, Illinois. 9 pp.

Illinois Department of Natural Resources. 2006. *Biodiversity of Illinois, volume I: aquatic habitats* CD-ROM. Illinois Department of Natural Resources, Springfield, Illinois.

Illinois Department of Natural Resources. 2006. *Biodiversity of Illinois, volume II: woodland habitats* CD-ROM. Illinois Department of Natural Resources, Springfield, Illinois.

Illinois Department of Natural Resources. 2006. *Biodiversity of Illinois, volume III: prairie and edge habitats* CD-ROM. Illinois Department of Natural Resources, Springfield, Illinois.

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

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

Pflieger, W. L. 1997. *The fishes of Missouri.* Conservation Commission of the State of Missouri, Jefferson City, Missouri. 372 pp.

Agency Resources

More information about Illinois fishes is available from the Illinois Department of Natural Resources (IDNR). The Division of Fisheries manages and monitors fish populations. Fisheries personnel also provide assistance to landowners regarding establishing and maintaining fish populations. The IDNR Education Section provides supplemental resources for educators to use, including the *Aquatic Illinois* resources trunk that is available for loan from more than 50 lending locations statewide and the *Biodiversity of Illinois* series of CD-ROMs that are field guides to more than 1,000 species in the state. Publications are available through http://dnr.state.il.us/teachkids. The Illinois Wildlife Preservation Fund, comprised of taxpayer donations, helps to support further understanding of Illinois' species by providing grants for projects such as the development of this poster.

Illinois Department of Natural Resources
One Natural Resources Way • Springfield, IL 62702-1271
http://dnr.state.il.us

Education Section
217-524-4126
dnr.teachkids@illinois.gov

Division of Fisheries
217-782-6424

Printed by the authority of the State of Illinois 12M - 5/10 IOCI 0881-10