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# **The Identification of the Nonnative Fishes Inhabiting Illinois Waters**

**Lawrence M. Page and Christopher A. Laird**

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Prepared by:

Center for Biodiversity  
Illinois Natural History Survey  
172 Natural Resources Building  
607 E. Peabody Drive  
Champaign, IL 61820

Prepared for:

Illinois Department of Conservation  
Division of Fisheries  
2106 SE Third Street  
Aldeo, IL 61231



## The Identification of the Nonnative Fishes Inhabiting Illinois Waters

For purposes of this report, a nonnative species is defined as one that did not occur in Illinois historically; an established nonnative is one that now lives and reproduces in Illinois waters as a result of human influence.

At the turn of the century, only one nonnative species of fish, the common carp, was established in Illinois (Forbes and Richardson 1908). In contrast, by 1979, six nonnative fishes were reproducing in Illinois (Smith 1979). In 1993, only 14 years later, seven more nonnative fishes have become established (Table 1), for a total of 13 species. In addition, a recent bait bucket release, the rudd, is likely to become established, and eight nonnative fishes are periodically stocked in Illinois or in adjacent states and are regularly encountered here (Table 1). Burr (1991) reviewed these and other changes in the fish fauna of Illinois that had occurred since Smith published The Fishes of Illinois (1979).

Several of the nonnative fishes have only recently become introduced and are expanding their ranges in Illinois. Included in this report are keys that will facilitate the identification of these species so that their distributions in the state and their impact on our environment can be monitored. Also included for each species is a brief summary of biology and Illinois distribution.

### Keys to the identification of nonnative fishes found in Illinois

The following keys are written as supplements to those published in Smith's (1979) The Fishes of Illinois, and some parts are taken verbatim from Smith. Nonnative fishes can be identified with the following keys; however, if you suspect that the fish you are attempting to identify is a native species, you should consult Smith (1979). Species in bold print are introduced to Illinois; families in bold print contain introduced species.

For some identifications, it will be best to begin with the family key and work your way through to the species. However, if you know from past experience that the fish you are working with is one of a few species (e. g., a shad), you can begin with a key to species. Species that have been introduced but are not reproducing (e. g., chinook salmon, brown trout) are included as well as established species.

Diagnostic counts given are those useful in separating species from closely related species. Lateral scale counts (often referred to elsewhere as lateral-line scale counts) refer to the number of scales along the lateral-line, if present and complete, or along the midside if lateral line is absent or incomplete. Maximum and common lengths are total lengths.

Table 1. Nonnative fishes in Illinois

Species established by 1979	Additional Species established by 1993	Other species by 1993
sea lamprey, <i>Petromyzon marinus</i>	grass carp, <i>Ctenopharyngodon idella</i>	silver carp, <i>Hypophthalmichthys molotrix</i>
alewife, <i>Alosa pseudoharengus</i>	bighead carp, <i>Hypophthalmichthys nobilis</i>	rudd, <i>Scardinius erythrophthalmus</i>
threadfin shad, <i>Dorosoma petenense</i>	Oriental weatherfish, <i>Misgurnus anguillicaudatus</i>	rainbow trout, <i>Oncorhynchus mykiss</i>
rainbow smelt, <i>Osmerus mordax</i>	white perch, <i>Morone americana</i>	coho salmon, <i>Oncorhynchus kisutch</i>
common carp, <i>Cyprinus carpio</i>	inland silverside, <i>Menidia beryllina</i>	chinook salmon, <i>Oncorhynchus tshawytscha</i>
goldfish, <i>Carassius auratus</i>	threespine stickleback, <i>Gasterosteus aculeatus</i>	pink salmon, <i>Oncorhynchus gorbuscha</i>
	Rio Grande cichlid, <i>Cichlasoma cyanoguttatum</i>	brown trout, <i>Salmo trutta</i>
	striped bass, <i>Morone saxatilis</i>	Atlantic salmon, <i>Salmo salar</i>

### Key to Illinois Families

1. Mouth without jaws; paired fins absent; seven gill openings (lampreys)  
 ..... **Petromyzontidae** (p. 7)  
 Mouth with jaws; at least one pair of fins present; one gill opening on each  
 side of head ..... 2
2. Dorsal fin extending more than half of body length; anterior nostrils tubular . 3  
 Dorsal fin single or double; if single, extending much less than half of body  
 length; anterior nostrils not tubular ..... 4
3. Dorsal, caudal, and anal fins continuous; scales tiny, deeply imbedded; body  
 snakelike (eels) ..... **Anguillidae**  
 Dorsal, caudal, and anal fins not continuous; scales large, body stoutly terete  
 (bowfins) ..... **Amiidae**
4. Caudal fin heterocercal (vertebral column flexed upward into caudal fin) ... 5  
 Caudal fin homocercal (vertebral column not flexed upward into caudal fin) . 7
5. Caudal fin rounded; snout a bony, strongly toothed beak; body completely  
 covered with scales (gars) ..... **Lepisosteidae**  
 Caudal fin forked; snout not a bony, strongly toothed beak; body not  
 completely scaled ..... 6
6. Snout long and paddle-shaped; body unscaled; two small barbels on underside  
 of snout (paddlefishes) ..... **Polyodontidae**  
 Snout conical or shovel-shaped; body with rows of bony plates; four large  
 barbels on underside of snout (sturgeons) ..... **Acipenseridae**
7. One set of paired fins (pectorals); head and jaws with row of sensory papillae;  
 eyes very small (cavefishes) ..... **Amblyopsidae**  
 Two sets of paired fins (pectorals and pelvics); head and jaws without rows of  
 sensory papillae; eyes variable ..... 8
8. Adipose (unrayed fatty) fin present ..... 9  
 No adipose fin ..... 12
9. Large barbels present around mouth (catfishes ) ..... **Ictaluridae**  
 No barbels present ..... 10
10. First one or two rays of dorsal and anal fins spiny; scales strongly ctenoid  
 and rough to the touch; small rather translucent fishes (trout-perches) ...  
 ..... **Percopsidae**  
 All fin rays soft; scales cycloid; usually large, normally pigmented fishes ... 11

11. No pelvic axillary process; lower jaw strongly projecting; usually 70 or fewer scales in lateral line; conspicuously enlarged teeth on jaws and tongue (smelts) ..... **Osmeridae** (p. 9)  
 Axillary process present at base of pelvic fin; jaws equal or lower jaw slightly projecting; usually more than 70 scales in lateral line; teeth not conspicuously enlarged on jaws and tongue (trout, salmon, whitefishes) ..... **Salmonidae** (p. 10)
12. Five pairs of large barbels around mouth; body elongate .. **Cobitidae** (p. 17)  
 Usually no barbels present (sometimes 1 pair or 1 single), body variable .. 13
13. Conspicuous median barbel near tip of chin; dorsal and anal fins each with 60 or more rays (codfishes) ..... **Gadidae**  
 No median barbel near tip of chin; dorsal and anal fins each with fewer than 35 rays ..... 14
14. Anus between gill membranes (except in small young, which have anus farther back, but well in front of anal fin) (pirate perches) ..... **Aphredoderidae**  
 Anus situated just in front of anal fin ..... 15
15. Anterior dorsal fin represented by two to nine spines, not connected by membrane (sticklebacks) ..... **Gasterosteidae** (p. 18)  
 Dorsal fin single or, if double, without isolated, unconnected spines ..... 16
16. Dorsal fin single and with up to three spiny rays ..... 17  
 Dorsal fin double or single; if single, anterior portion with more than three spiny rays ..... 25
17. Dorsal fin with one stout spine (goldfish and common carp) ..... **Cyprinidae** (p. 20)  
 Dorsal fin without sharp spine ..... 18
18. Head and cheeks unscaled ..... 19  
 Head partly or entirely scaled ..... 22
19. Axillary process at base of pelvic fin; conspicuous adipose eyelid ..... 20  
 No pelvic axillary process; no adipose eyelid ..... 21
20. Midline of belly with sawtoothed edge; dorsal fin base situated well anterior to anal fin base; lateral line absent; many long slender gill rakers (herrings, shads) ..... **Clupeidae** (p. 28)  
 Midline of belly with untoothed keel; dorsal fin base situated partly or entirely over anal fin base; lateral line present; a few short, knobby gill rakers (mooneyes) ..... **Hiodontidae**

21. Lips thickened, striate and papillose (except in buffalos); anal fin usually situated posteriorly, its adpressed rays reaching, or almost reaching, caudal fin base; 10 or more dorsal rays (except in creek chubsucker, which has a sucking mouth and no lateral line) (suckers) . . . Catostomidae  
Lips thin (except in the suckermouth minnow); anal fin usually situated farther forward, its adpressed rays far short of caudal fin base; nine or fewer dorsal rays (minnows) . . . . . **Cyprinidae** (p. 20)
22. Caudal fin forked; snout a ducklike beak; jaws with large canine teeth; scales small, more than 90 in lateral series (pikes) . . . . . Esocidae  
Caudal fin rounded; snout not a ducklike beak; jaws without canine teeth; scales large, fewer than 50 in lateral series . . . . . 23
23. Mouth terminal; no transverse groove between snout and upper lip; origin of pelvic fins closer to caudal fin base than to tip of snout (mudminnows) . . . . . Umbridae  
Mouth upturned; upper lip separated from snout by deep transverse groove; origin of pelvic fins closer to tip of snout than to caudal fin base . . . . . 24
24. Anal fin of male without elongated anterior rays and not modified as an intromittent organ; body with bars or stripes (topminnows) . . . . . Fundulidae (previously Cyprinodontidae)  
Anal fin of male with elongated anterior rays and modified as an intromittent organ; body without bars or stripes (mosquitofishes) . . . . . Poeciliidae
25. Body unscaled; four or fewer pelvic rays (sculpins) . . . . . Cottidae  
Body scaled; five or more pelvic rays . . . . . 26
26. Large gap between small anterior and large posterior dorsal fins; origin of pelvic fin well behind origin pectoral fin (silversides) . **Atherinidae** (p. 31)  
Dorsal fins continuous or separated by narrow gap; origin of pelvic fin under or slightly behind origin pectoral fin . . . . . 27
27. Lateral line extends to end of caudal fin; base of first dorsal fin approximately half as long as base of second (drums) . . . . . Sciaenidae  
Lateral line, if present, not continued to end of caudal fin; if dorsal fins are separate, first more than half length of second . . . . . 28
28. Lateral line interrupted with front portion higher on body than rear portion; single nostril on each side of head . . . . . **Cichlidae** (p. 33)  
Lateral line continuous, if present; 1 pair of nostrils on each side of head . . 29
29. Three or more anal spines; body deep and slab-sided . . . . . 30  
One or two anal spines; body usually more or less terete (perches and darters) . . . . . Percidae

30. Large spine on rear edge of gill cover; sawtoothed edge on preopercle  
(temperate basses) ..... **Moronidae** (p. 34)  
No spine on gill cover; smooth-edged preopercle (sunfishes) .. Centrarchidae

## Petromyzontidae

## Key to Adult Lampreys

1. Prominent black mottling on body and fins; 2 dorsal fins separated at base; to 47 inches (120 cm) (sea lamprey) ..... *Petromyzon marinus*
- No prominent dark mottling (body dark olive light below); slightly notched dorsal fin or 2 dorsal fins joined at base; to 15 1/2 inches (39 cm) ..... native lampreys

*Petromyzon marinus*, sea lamprey

### Origin and Range

This fish is native to the Atlantic Ocean and Lake Ontario. The 1820 construction of the Welland Canal allowed this and other migratory fish to bypass Niagara Falls and move from Lake Ontario to the western Great Lakes. The sea lamprey was first found in Illinois on a lake trout from Lake Michigan in 1936 (Hubbs and Pope 1937). Sea lampreys were so abundant in Lake Michigan during the 1940's and 50's that they were a major pest species. During the 1960's the sea lamprey population was reduced, at least in part, through the use of a chemical pesticide that kills the larvae. This species is still present in Lake Michigan, but in much reduced numbers. Maximum size is 47 inches (120 cm); adults commonly reach 15-25 inches (38-64 cm).

### Biology

Spawning occurs in streams in which a pit nest is constructed and eggs are deposited. After hatching, the ammocoete spends 6-8 years in the mud of a quiet pool, after which it undergoes metamorphosis. The adult migrates back to the lake where it lives for one to three years.

### Diagnostic Counts

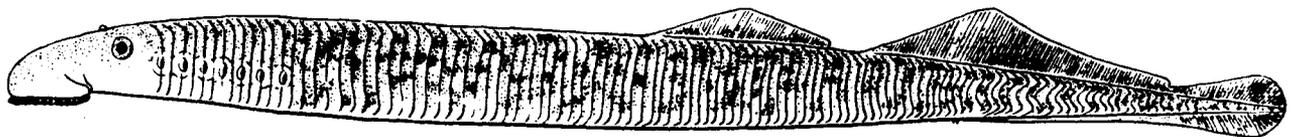
Usually 66-75 trunk myomeres; 2 supraorbital teeth; usually 2-2-2-2 lateral circumoral teeth, 8-10 posterior circumoral teeth, 7-8 infraoral teeth.

### Expansion

It is unlikely that the range of the sea lamprey in Illinois will change.

### Impact on Illinois

The sea lamprey contributed to a major decline in several native salmonids in Lake Michigan, especially the lake trout and the cisco. Populations of native fishes, as well as the Lake Michigan commercial fishing industry will probably never recover to pre-lamprey levels. Presently the sea lamprey population is controlled and its impact on native fishes has been reduced.



## Osmeridae

The only osmerid in Illinois is the introduced rainbow smelt.

*Osmerus mordax*, rainbow smelt

### Origin and Range

The rainbow smelt is native to arctic and temperate regions of the northern hemisphere as well as parts of eastern Asia. Rainbow smelt became established in Lake Michigan as the result of an introduction in Crystal Lake, Michigan in 1912 (Hubbs and Lagler 1941). When Smith (1979) conducted his survey of Illinois the rainbow smelt was common in Lake Michigan and occasionally strayed into the Illinois River system. Today it remains common in Illinois waters of Lake Michigan and also inhabits the Illinois, Ohio, Wabash and Mississippi rivers (Burr 1991).

### Biology

Rainbow smelt are usually found in clear, cool waters of lakes and medium to large rivers. Coastal populations are anadromous. Spawning occurs in the spring for about 2 weeks, during which adults congregate and broadcast their adhesive eggs over the substrate (Smith 1979). Rainbow smelt consume small fish and invertebrates, especially crustaceans. Maximum adult size is 13 inches (33 cm); adults commonly reach 6 inches (15 cm).

### Diagnostic Counts

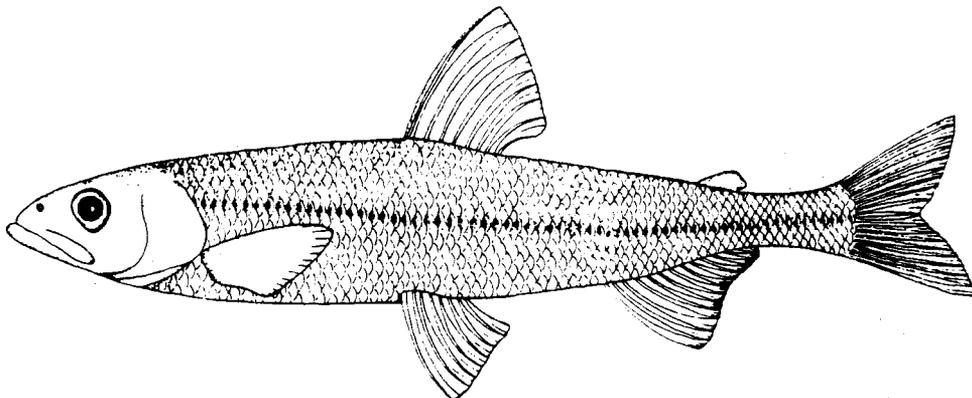
62-72 lateral scales; 11-16 anal rays; usually 28-32 rakers on first gill arch.

### Expansion

Rainbow smelt are reproducing in Lake Michigan and will probably remain common there. In winter samples from the Mississippi River the rainbow smelt is sometimes the most abundant species, but it has not been collected in the late summer, and is probably not reproducing in the Illinois portions of the river. Rainbow smelt will probably remain sporadically common in the Mississippi and Ohio rivers.

### Impact on Illinois

If the rainbow smelt becomes common in Illinois rivers, it will compete with native species for food and increase predation on small fishes. It may serve as food for large fishes. It is not collected commercially in Illinois.



Salmonidae

Key to trouts and salmons

1. Mouth of adult white inside; usually 10-12 branchiostegal rays ..... 2  
Mouth of adult black inside; usually 12-19 branchiostegal rays ..... 6
2. Black or brown spots on light body; fewer than 160 lateral-line scales ..... 3  
Light spots (occasionally red) on dark body; more than 160 lateral-line scales .  
..... 5
3. Vomerine teeth little developed, those on the shaft of the bone few and deciduous; anal rays 9; adults with x-shaped spots on side (Atlantic salmon) ..... *Salmo salar*  
Vomerine teeth well developed, those on the shaft of the bone numerous, persistent, and arranged in 1 zigzag or 2 alternating rows; anal rays usually 10-13; side usually with round spots ..... 4
4. Few large black or brown spots on body; few or none on caudal fin; reddish spots more or less strongly developed (often surrounded by light border); adipose fin orange or red-orange, without dark margin or spots; no pink to rose stripe along side of body (brown trout) ..... *Salmo trutta*  
Many small black or brown spots on body and caudal fin; no red spots; adipose fin olive, with black margin or spots; broad pink to rose stripe present along side of body (rainbow trout) ..... *Oncorhynchus mykiss*
5. Caudal fin little forked; red spots on body; lower fins each with black stripe near leading edge; 9-12 gill rakers; mandibular pores usually 7-8 on each side (brook trout) ..... *Salvelinus fontinalis*  
Caudal fin strongly forked; no red spots on body; lower fins without black stripe; 12-14 gill rakers; mandibular pores usually 9 or 10 on each side (lake trout) ..... *Salvelinus namaycush*
6. 147-205 lateral-line scales; large black spots on back and both lobes of caudal fin, largest as large as eye; gill rakers on first arch 24-35, breeding males with distinct humpback (pink salmon) ..... *Oncorhynchus gorboscha*  
112-165 lateral-line scales; small dark spots on back and caudal fin, largest as large as pupil of eye; gill rakers 16-26 on first arch; breeding males without humpback ..... 7
7. Entire mouth, including gums black; 14-19 anal fin rays; 140-185 pyloric caeca; small black spots on both lobes of caudal fin (chinook salmon) .....  
..... *Oncorhynchus tshawytscha*  
Gums whitish; 11-15 anal fin rays; 45-114 pyloric caeca; small black spots when present on caudal fin, on upper fin only (coho salmon) .....  
..... *Oncorhynchus kisutch*

*Salmo salar*, Atlantic salmon

### **Origin and Range**

Atlantic salmon are native to the northeastern coastal drainages of North America and Lake Ontario. They have been widely stocked but usually unsuccessfully. In Illinois they have been found only in the lower Mississippi River (Burr 1991).

### **Biology**

During the spawning season, Atlantic salmon females use their tails to dig a pit in the substrate. Spawning takes place in this pit and the fertilized eggs are then covered with gravel. Atlantic salmon usually survive spawning and may do so more than once. Coastal populations are anadromous. Individuals at sea consume fish while those in landlocked populations rely more heavily on insects. Spawning adults do not feed. Atlantic salmon can become large, reaching a maximum of 55 inches (140 cm) in length; adults rarely exceed 35 inches (90 cm), commonly reach 24 inches (61 cm).

### **Diagnostic Counts**

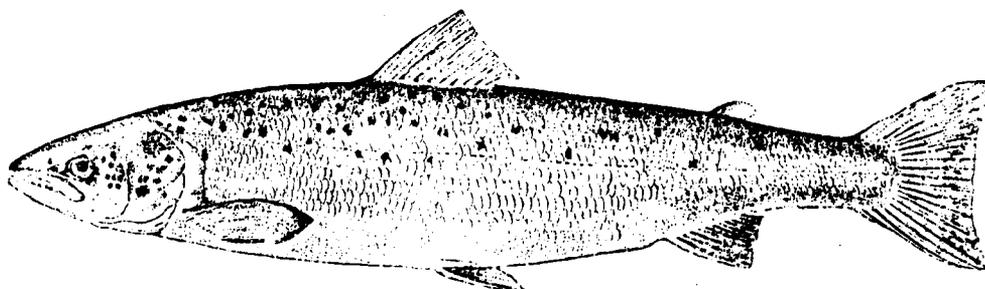
Usually 12 branchiostegal rays; 11 dorsal rays; 109-121 lateral scales; 8-11 anal rays; young have 8-11 narrow parr marks.

### **Expansion**

This species is not reproducing in Illinois and is not common. It is not likely to become common or widely distributed.

### **Impact on Illinois**

This species has no impact on other Illinois species.



*Salmo trutta*, brown trout

### **Origin and Range**

This species is native to Europe, western Asia and northern Africa. Brown trout have been stocked heavily throughout the world, including in Lake Michigan and northern Illinois.

### **Biology**

Brown trout feed on invertebrates and fish, with fish composing a larger portion of the diet in large individuals. Spawning behavior is similar to that of the Atlantic salmon with the female constructing a spawning nest and covering the fertilized eggs with gravel after spawning. Cool, clear gravel bottomed streams are required. Maximum size is 40 1/2 inches (103 cm); adults commonly reach 15 inches (38 cm).

### **Diagnostic Counts**

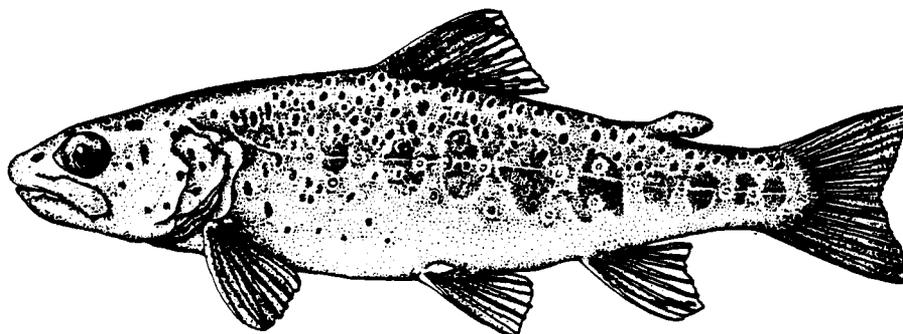
Usually 10 branchiostegal rays; 9 dorsal rays; 120-130 lateral scales; 10-12 anal rays; young have 9-14 short narrow parr marks.

### **Expansion**

Brown trout are highly prized as game fish and have at times been heavily stocked in Illinois. However, there is little suitable habitat and the species does not reproduce.

### **Impact on Illinois**

Brown trout are not sufficiently common in Illinois to affect other species. Neither the brown trout nor any of the other introduced salmonids are being commercially harvested in Illinois.



*Oncorhynchus mykiss*, rainbow trout

### Origin and Range

Rainbow trout are native to the western coast of North America and have been widely introduced throughout the world. This anadromous species has been repeatedly stocked in Lake Michigan and several northern Illinois streams. Rainbow trout have also been stocked in some southern Illinois reservoirs and are known to have oversummed and reproduced in Devil's Kitchen Lake in Williamson County (Brooks Burr, pers. comm.).

### Biology

Anadromous and landlocked populations of this species spawn in cold clear rocky streams. Eggs are deposited in a pit in the substrate, fertilized and covered with gravel upon completion of the spawning act. Food consists primarily of fish and invertebrates. Rainbow trout reach a maximum of 45 inches (114 cm) in length; adults commonly reach 15 inches (38 cm).

### Diagnostic Counts

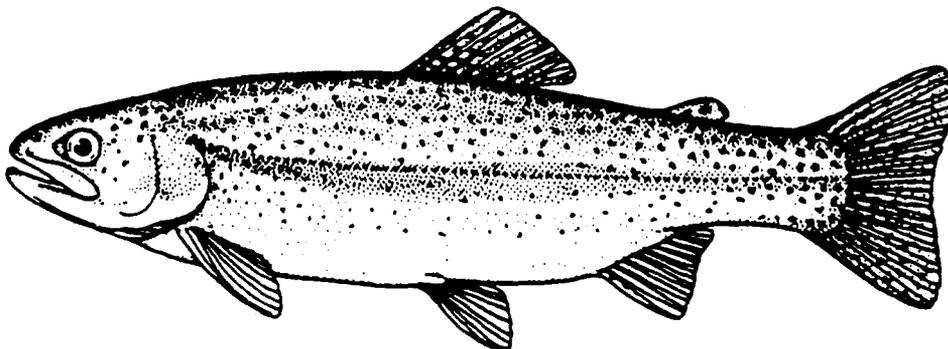
115-130 lateral scales; 10-12 dorsal rays; 8-12 anal rays; young have 5-10 widely spaced, short oval parr marks;

### Expansion

Rainbow trout are established in upper Lake Michigan and sometimes stray into Illinois waters. When stocked in reservoirs this species can only persist when depths are great enough to allow water on the bottom to remain cool throughout the summer. Consequently, little suitable habitat for this species exists in Illinois and the rainbow trout is not expected to become widespread.

### Impact on Illinois

In Illinois streams rainbow trout are not common enough to have an effect. In Lake Michigan this species and other introduced salmonids have the potential to consume native species and compete with native salmonids.



*Oncorhynchus gorbuscha*, pink salmon

**Origin and Range**

The pink salmon is native to the northwestern coast of North America and the northeastern coast of Asia, including Japan and Korea. It is not being stocked in Illinois, but reproducing populations exist in northern Lake Michigan, where stocking takes place. Strays from this area are finding their way to Illinois, and are occasionally found in Illinois waters of Lake Michigan.

**Biology**

Pink salmon ascend only a short distance up coastal streams to spawn, where males battle for territories on which spawning takes place (Moyle 1976). As with other pacific salmon, spawning takes place in a shallow pit, or redd, which is constructed by the female. Eggs are slow to hatch, taking up to six months (Moyle 1976). Adults die after spawning. Diet consists of invertebrates and fish with larger individuals becoming increasingly piscivorous. Pink salmon reach a maximum of 30 inches (76 cm); adults commonly reach 20 inches (51 cm).

**Diagnostic Counts**

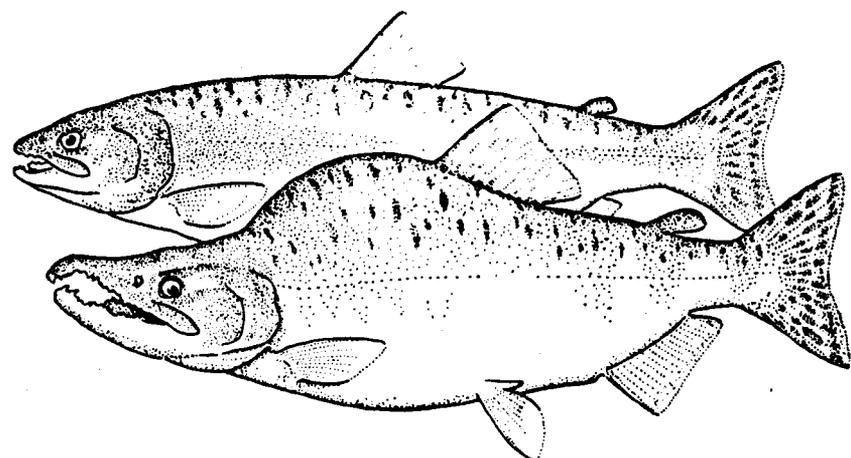
169-198 lateral scales; 10-16 dorsal rays; 13-19 anal rays; young lack parr marks.

**Expansion**

This species is present in Illinois only as a straggler from northern Lake Michigan and is not expected to become common in Illinois or to invade new areas.

**Impact on Illinois**

The pink salmon is too rare in Illinois to affect other species.



*Oncorhynchus tshawytscha*, chinook salmon

### Origin and Range

The chinook salmon is native to the northwestern coast of North America, and the northeastern coast of Asia. It was introduced into Lake Michigan by the Michigan Department of Conservation in 1967 (Smith 1979). Today the chinook salmon is fairly common in Lake Michigan.

### Biology

The spawning behavior of this species is similar to that of the coho salmon with the exception that it usually utilizes larger rivers for its spawning runs (Moyle 1976). Chinook salmon feed on fish and invertebrates and can reach a large maximum size, up to 58 inches (147 cm) in anadromous populations; landlocked adults commonly reach 24 inches (61 cm).

### Diagnostic Counts

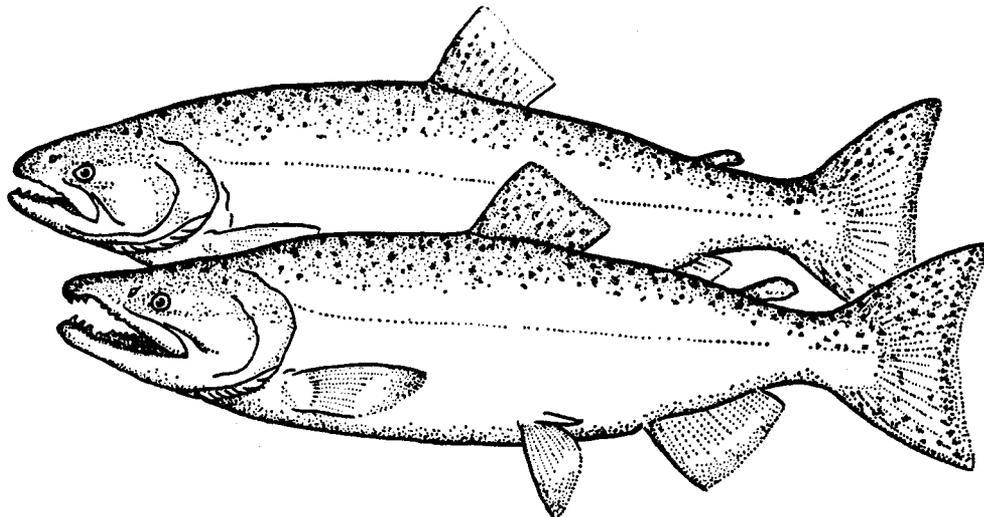
130-165 lateral scales; 10-14 dorsal rays; 14-19 anal rays: young have 6-12 large parr marks.

### Expansion

No reproduction of this species occurs in Illinois. It reproduces in the tributaries of northern Lake Michigan, where it is more common. Chinook salmon are not expected to invade new areas of Illinois.

### Impact on Illinois

Like other pacific salmonids the chinook competes with the native lake trout. It also aids in the control of alewife populations.



*Oncorhynchus kisutch*, coho salmon

### Origin and Range

Coho salmon are native to the western coast of North America, and the northeastern coast of Asia. This species was first introduced to Lake Michigan in 1967 as a new sport fish and to control the alewife population. It is not found outside of Lake Michigan in Illinois.

### Biology

Food consists of invertebrates and small fish. Spawning occurs over a pit in the gravel which the female constructs prior to the spawn. Eggs are released into the pit and fertilized, then covered. The eggs hatch 8-12 weeks later, and fry emerge from the substrate 4-10 weeks after hatching (Moyle 1976). All native populations are anadromous. Maximum size is 38 1/2 inches (98 cm); adults commonly reach 21 inches (53 cm).

### Diagnostic Counts

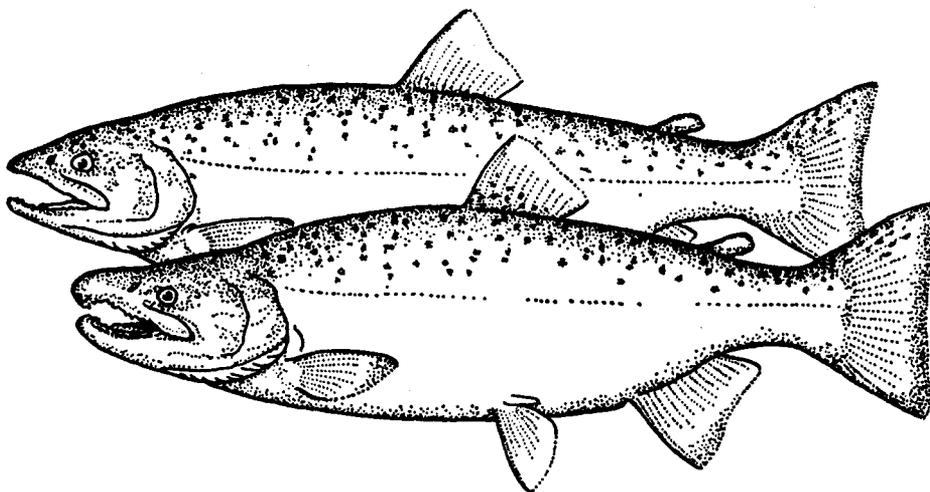
121-148 lateral scales; 9-12 dorsal rays; 12-17 anal rays; young have 8-10 narrow parr marks.

### Expansion

Coho salmon are established in Michigan waters of Lake Michigan. No reproduction for this species occurs in Illinois, but continued stocking and strays from northern parts of the lake contribute to its continued presence in Illinois waters. Coho salmon are by far the most common introduced salmonid found in Lake Michigan (Tom Trudeau, pers. comm.). It is not expected to be encountered in Illinois streams.

### Impact on Illinois

This species competes with native lake trout for food and is an important predator of the alewife.



## Cobitidae

The only cobitid in Illinois is the introduced Oriental weatherfish.

*Misgurnus anguillicaudatus*, Oriental weatherfish

### Origin and Range

Oriental weatherfish are native to Asia and were released in Illinois waters by home aquarists. This species was first collected from Illinois in 1987. Presently the range of this species in Illinois is Lake Michigan and contiguous streams.

### Biology

The Oriental weatherfish is omnivorous with a preference for worms and insect larvae. It prefers a muddy substrate and often burrows into the mud such that all but its head is buried. In Asia spawning takes place from April to June and involves various courtship behaviors, after which the eggs are deposited on vegetation or on the mud between plants (Sterba 1966). Maximum size is 10 inches (25 cm); adults commonly reach 5 inches (13 cm).

### Diagnostic Counts

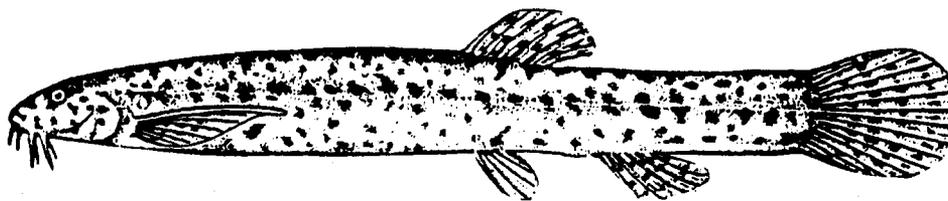
Ten barbels around mouth; 7-8 anal rays; 9 dorsal rays; 6-7 pelvic rays.

### Expansion

The Oriental weatherfish is reproducing in Illinois, but it is not known how abundant and widespread it will become. Although it is possible that it will spread throughout the state, introductions of this species elsewhere in North America (CA, MI, and ID) resulted only in localized populations.

### Impact on Illinois

If the Oriental weatherfish remains confined to extreme northeastern Illinois, it is unlikely to have much impact on other species. If it becomes more abundant and spreads it could reduce populations of insects fed on by native fishes.



## Gasterosteidae

## Key to species of sticklebacks

1. Three dorsal spines, the last very short; large bony plates on side (threespine stickleback) ..... *Gasterosteus aculeatus*  
     Five to 12 short dorsal spines; no bony plates on side ..... 2
2. Four to 6 dorsal spines; no bony keel on caudal peduncle (brook stickleback) ..... *Culea inconstans*  
     Seven to 12 (usually 9) dorsal spines; bony keel on caudal peduncle (ninespine stickleback) ..... *Pungitius pungitius*

*Gasterosteus aculeatus*, threespine stickleback

### Origin and Range

The threespine stickleback has a circumpolar distribution in the northern hemisphere and is increasing its range in the Great Lakes region. Lee et. al. (1980) reported collections of this species from Lake Ontario and the St. Lawrence River, but none for the more western Great Lakes. The first collections from Illinois were made in Cook and Lake counties in 1988 (Johnston 1991). Since then several more collections have been made in these two counties, but none from other Illinois counties.

### Biology

Threespine sticklebacks usually occur in the presence of vegetation and a sandy substrate. They will eat any animal matter that they encounter, including conspecific eggs and fry. The spawning behavior of the threespine stickleback is quite interesting and has been the subject of a great deal of study. The following is from Scott and Crossman (1973). Male sticklebacks defend a territory and build a tube shaped nest on it. Males then attempt to attract females by performing an intricate "dance" after which the female deposits eggs in the nest and the male fertilizes them. A male's nest can be visited by several females. The male guards the eggs and fry. Maximum size is 4 inches (10 cm).

### Diagnostic Counts

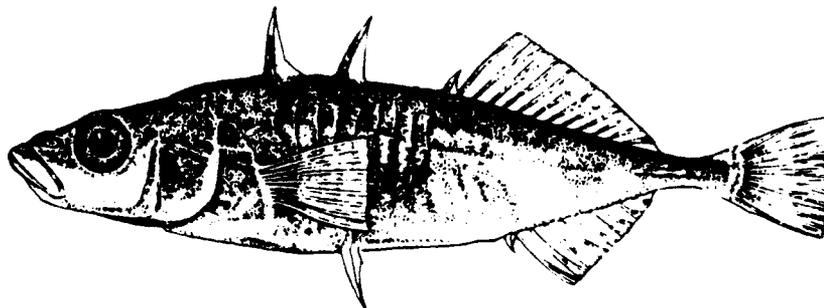
2-4 (usually 3) dorsal spines; pelvic fin with 1 spine and 1 ray.

### Expansion

The threespine stickleback is reproducing in Illinois waters of Lake Michigan. It is a coastal species and doesn't frequently stray far inland. This species will probably increase in abundance in the Lake Michigan area, but is unlikely to infiltrate more inland portions of the state.

### Impact on Illinois

In some areas this species is an important forage fish for salmonids and fish-eating birds. If its abundance increases it might play this role in Illinois as well. However, it is known to prey on the eggs of other species, and might have a negative impact on native species.



## Cyprinidae

## Key to introduced minnows and the similar golder shiner

1. Dorsal fin long, 15-21 rays ..... 2  
    Dorsal fin short, 8-11 rays ..... 3
2. Conspicuous barbels around mouth; 32-37 lateral-line scales (common carp) ..  
    ..... *Cyprinus carpio*  
    No barbels; 26-30 lateral-line scales (goldfish) ..... *Carassius auratus*
3. Ventral keel present between anal and pelvic fin bases (scaleless or with  
    scales) ..... 4  
    No ventral keel (grass carp) ..... *Ctenopharyngodon idella*
4. More than 85 lateral-line scales ..... 5  
    Fewer than 55 lateral-line scales ..... 6
5. Ventral keel extending from anus to isthmus between gill covers; gill rakers  
    fused into porous plate; sides plain (silver carp) .....  
    ..... *Hypophthalmichthys molotrix*  
    Ventral keel extending from anus to pelvic fin base; gill rakes comblike; sides  
    covered with small dark blotches (bighead carp) .....  
    ..... *Hypophthalmichthys nobilis*
6. No scales on keel; clear to yellow fins; no black on tail; usually 9-11 dorsal rays;  
    10-11 anal rays; 10-13 rakers on first gill arch; pharyngeal teeth 3,5-5,3  
    (golden shiner) ..... *Notemigonus chrysoluecas*  
    Scaled keel; red fins; anterior portion of caudal fin with black rays; usually 7-9  
    dorsal rays; 11-14 anal rays; 17-19 rakers on first gill arch; pharyngeal teeth  
    0,5-5,0 (rudd) ..... *Scardinius erythrophthalmus*

*Cyprinus carpio*, common carp

### Origin and Range

Native to Eurasia, the common carp first arrived in North America in 1831 and is now widely distributed. It was distributed throughout Illinois by the time of Forbes and Richardson's survey of Illinois fishes (1908) and was described as abundant in all parts of the state by Smith (1979). It remains common in most areas of Illinois.

### Biology

Common carp are omnivorous benthic feeders and are most abundant over silt or mud, often near vegetation. Eggs are broadcast over the substrate during spring and summer. Young grow rapidly, often measuring over 6 inches in length after 1 year (Pflieger 1975). When common carp and goldfish inhabit the same waters, hybrids can be common. Maximum size is 48 inches (122 cm); adults commonly reach 24 inches (61 cm).

### Diagnostic Counts

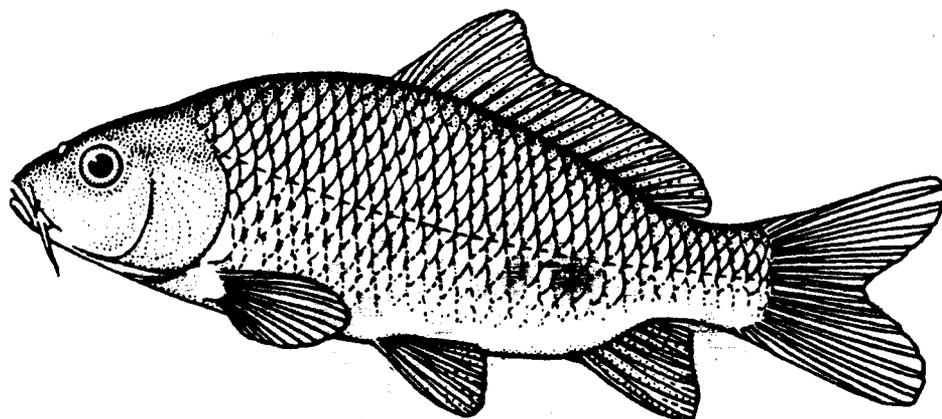
32-38 lateral scales; 17-21 dorsal rays; 5-6 anal rays; pharyngeal teeth 1,1,3-3,1,1.

### Expansion

The distribution and abundance of common carp in Illinois is not expected to change in the near future.

### Impact on Illinois

Common carp have been present in Illinois since the earliest surveys, making their effects on native Illinois fauna difficult to determine. Common carp tend to destroy vegetation and increase water turbidity by pulling up plants and rooting around in the substrate, causing a deterioration of habitat for species requiring vegetation and clear water. Common carp have also been accused of predation on eggs of other species. This species attains a large size and has become an important commercial food species in Illinois, however, it may have done so at the expense of ecologically similar species such as carpsuckers and buffalos.



*Carassius auratus*, goldfish

### **Origin and Range**

Native to eastern Asia, the goldfish was introduced into North America as early as the late 1600's (Page and Burr 1991), and had become established in Illinois rivers by the time Nelson (1876) conducted his survey of Illinois fishes. Smith (1979) reported it to be most abundant in the Illinois River and its Chicago area headwaters, and sporadically distributed elsewhere in the state. The goldfish remains common only in the upper Illinois River system.

### **Biology**

The goldfish prefers vegetated pools, but its high tolerance of turbidity and pollution has enabled it to survive in some of the streams and canals in the Chicago area where few other species persist. Diet consists primarily of plant and detrital matter. Spawning occurs throughout the late spring and summer (Smith 1979). Females scatter thousands of adhesive eggs over the substrate. Goldfish commonly reach about 12 inches (30 cm) in length; the maximum recorded length is 16 inches (41 cm).

### **Diagnostic Counts**

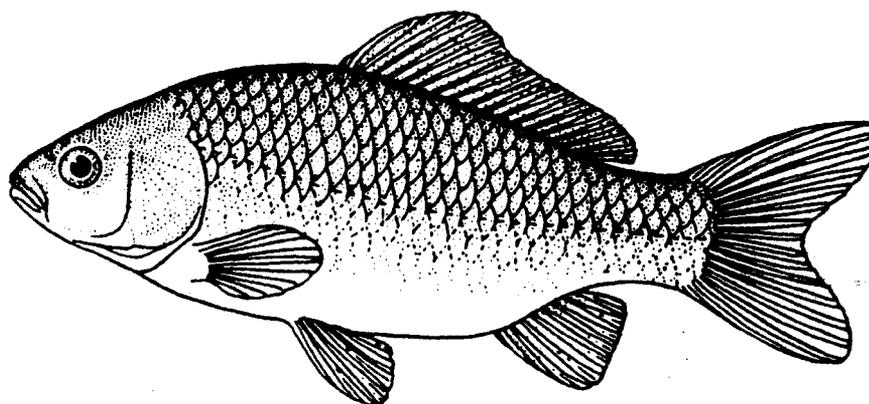
15-21 dorsal fin rays; 5-7 anal fin rays; 25-31 lateral scales;  
pharyngeal teeth 0,4-4,0.

### **Expansion**

Only severely disturbed areas are susceptible to establishment of goldfish. Its distribution in Illinois will increase or decrease depending on the future condition of our streams.

### **Impact on Illinois**

Goldfish have little impact on other Illinois fishes because they are common only in areas that are so severely disturbed that few other species are present.



*Ctenopharyngodon idella*, grass carp

### Origin and Range

This herbivorous fish is native to eastern Asia. It was introduced to North America as a biological control for aquatic vegetation in the early 1960's. From its point of introduction in Arkansas it has now spread to at least 34 states. The first collection in Illinois occurred in 1971, and Smith (1979) reported its presence in the Mississippi River as far north as Pike County. Today grass carp occur sporadically in the southern 1/2 of the Illinois portion of the Mississippi River and have been collected from the Illinois River in Mason County (INHS 87633, 88126), the Chicago River in Cook County (INHS 59326), the Cache River in Alexander/Pulaski Counties (SIUC 19962), the Big Muddy River in Jackson County (SIUC 20294), Clear Creek in Alexander County (SIUC 20537), and the Kaskaskia River in Clinton County.

### Biology

Grass carp inhabit quiet water including lakes, ponds, and pools and backwaters of large rivers. Grass carp are mostly herbivorous, but occasionally consume animal matter. Within its native range, spawning occurs from April to August in water from 19°C - 30°C (Robison and Buchanan 1990). Females release hundreds of thousands of eggs that float until hatching in 24 - 36 hours (Berg 1964). In Florida it was shown that a current of 0.23m/s was sufficient for successful incubation of eggs (Leslie, et al. 1982). Maximum size is 49 inches (125 cm); normal adult size is about 39 inches (100 cm).

### Diagnostic Counts

34-45 lateral scales; 7-9 dorsal rays; 8-10 anal rays; pharyngeal teeth 2,5-4,2 or 2,4-4,2.

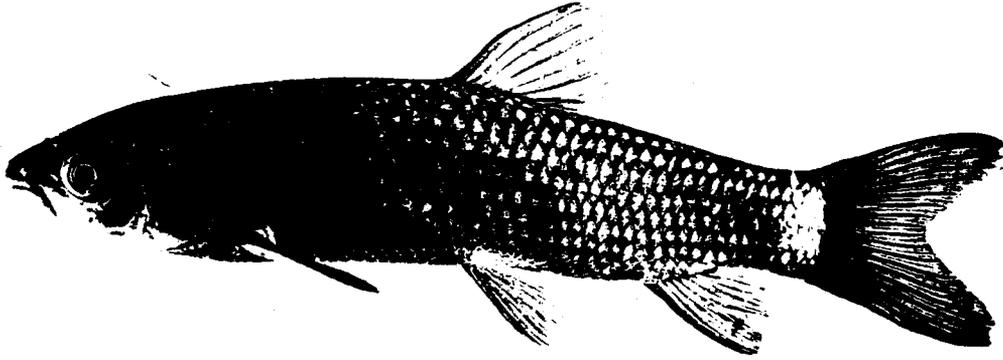
### Expansion

Recent field work indicates that grass carp are reproducing in Illinois waters (SIUC 19962, INHS 30406). This species is likely to become more numerous and widespread in the larger rivers of the Mississippi drainage in Illinois.

### Impact on Illinois

The feeding habits of the grass carp make it unsuitable for sport fishing. Grass carp are commonly collected by commercial fishermen in the large rivers of the southern part of the state. It is not known how common the grass carp will become and, thus, its future importance as a food source is unknown. The grass carp has the potential to destroy habitat important to many other species, including threatened and endangered species. The blacknose shiner, *Notropis heterolepis*, pugnose shiner, *Notropis anogenus*, Iowa darter, *Etheostoma exile*, and other threatened or endangered species are dependent on aquatic plants for cover from predators and as spawning substrate. Other organisms, such as

waterfowl, will also be negatively affected by alteration of vegetated aquatic habitats.



*Hypophthalmichthys molitrix*, silver carp

### Origin and Range

This fish and the similar bighead carp are native to the large lowland rivers of eastern Asia (Robison and Buchanan 1990). The silver carp was introduced into Arkansas in 1973 (Henderson 1976). It spread through the state and by the early 1980's Arkansas' commercial fishermen were catching this species from the Mississippi River (Carter and Beadles 1983). Smith (1979) made no mention of this species in Illinois waters, but today commercial fishermen frequently catch them from the Mississippi River. Documented collections of this species exist from the Mississippi River in Monroe (SIUC 17716) and Jackson (INHS 88425) counties.

### Biology

Silver carp are filter feeders specializing on green and blue-green algae (Robison and Buchanan 1990). Spawning in China occurs from April to August when rivers are high (Berry and Low 1970). Eggs are buoyant and require current until they hatch at a water temperature of about 22-24°C (Robison and Buchanan 1990). It was previously believed that neither the bighead or silver carp could reproduce in North American rivers; however, there is now evidence of bighead carp reproduction in the Mississippi drainage. Reproductive requirements are similar for the bighead and silver carp, indicating that silver carp may have the potential to successfully spawn in the Mississippi River. However, no evidence for spawning yet exists. This species becomes quite large, commonly reaching 39 inches (100 cm). Maximum weight about 60 lbs. (27 kg).

### Diagnostic Counts

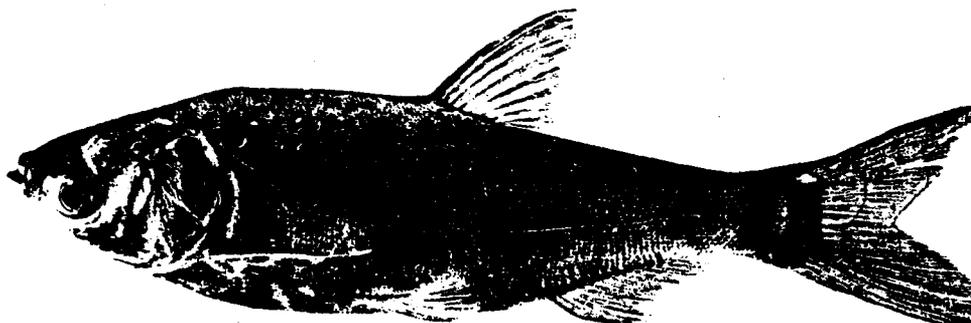
95-103 lateral scales; 12-13 anal rays; 8 dorsal rays; pharyngeal teeth 4-4.

### Expansion

The silver carp is likely to become established in Illinois, and to occupy suitable habitats throughout the state.

### Impact on Illinois

The silver carp has some potential as a food fish because of its large size, rapid growth and acceptable flavor, and it has also been used in Arkansas for removal of excessive algae from waste water. The impact of this species on aquatic ecosystems is not yet known and is highly dependent on the extent to which populations increase. It has the potential to do enormous damage to populations of native organisms because it feeds on plankton, the same food consumed by larval fishes and native mussels.



*Hypophthalmichthys nobilis*, bighead carp

### Origin and Range

Like the closely related silver carp, the bighead carp was introduced into Arkansas in 1973 for use as an aquaculture species (Henderson 1976). It has been collected from the Mississippi River in Henderson (INHS 62722), Hancock (INHS 62723), Calhoun (Robert Maher pers. comm.) and Madison (SIUC 19282) counties; from the Illinois River in Mason (INHS 59111) and Schuyler (INHS 62721) counties; from the Big Muddy River in Jackson (SIUC 20308) and Union (SIUC 19289) counties; and from the Kankakee River in Kankakee (INHS 27896) County. In addition to above records, bighead carp have been taken by fishermen snagging for paddlefish near lock and dam #21 of the Mississippi River and are commonly captured there in commercial fishermen's nets (Robert Maher pers. comm.).

### Biology

Bighead carp are filter feeders, specializing on zooplankton, in contrast to silver carp, which specialize on phytoplankton (Robison and Buchanan 1990). It is similar to the silver carp in its reproductive requirements. This species becomes quite large, commonly reaching 39 inches (100 cm). Maximum weight about 60 lbs. (27 kg).

### Diagnostic Counts

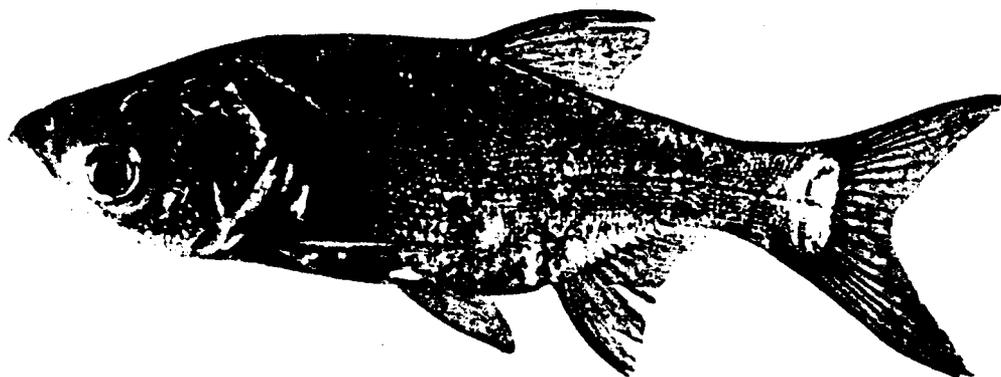
85-100 lateral scales; 13-14 anal rays; 8-9 dorsal rays; pharyngeal teeth 4-4.

### Expansion

Young-of-the-year (SIUC 20308) have been collected in Illinois suggesting that the bighead carp is reproducing here. Once established it can be expected to occupy suitable habitat throughout the state.

### Impact on Illinois

The bighead carp has a better flavor than the silver carp and is more likely to be used for food (Robison and Buchanan 1990). It has also been used for removal of excessive algae and nutrients from waste water. The impact of this species on Illinois' aquatic ecosystems is not yet known. Bighead carp attain a large size and grow rapidly. Consequently, this species has the potential to deplete zooplankton populations, which are also the food of the fry of most fish species, of certain adult fishes (e. g., shad, paddlefish), and of native freshwater mussels.



*Scardinius erythrophthalmus*, rudd

### **Origin and Range**

Native to Eurasia, this minnow was introduced to the U. S. as early as 1897 (Bean 1897, 1903; Hubbs 1921), but until recently populations were established only in Maine and New York (Courtenay et al. 1986; exotic species data base, National Fisheries Research Center-Gainesville [NFRCC-G]). Recent Illinois captures result from the distribution of the rudd as a new bait minnow by the Arkansas fish farming industry (Burkhead and Williams 1991). The rudd has been found in bait shops at Carlyle Lake, in Clinton County (Brooks Burr, pers. comm.) This species has been collected from Illinois' waters in Kendall (INHS 64740), Lake (INHS 64739), and Will (INHS 65512, 65419, 64430) counties.

### **Biology**

Rudd are broadcast spawners and deposit their adhesive eggs over vegetation. Adults feed mostly on surface and terrestrial insects. Rudd are usually found in sluggish water and become large, up to 19 inches (48 cm); adults commonly reach 10 inches (25 cm). No Illinois reproduction has been documented.

### **Diagnostic Counts**

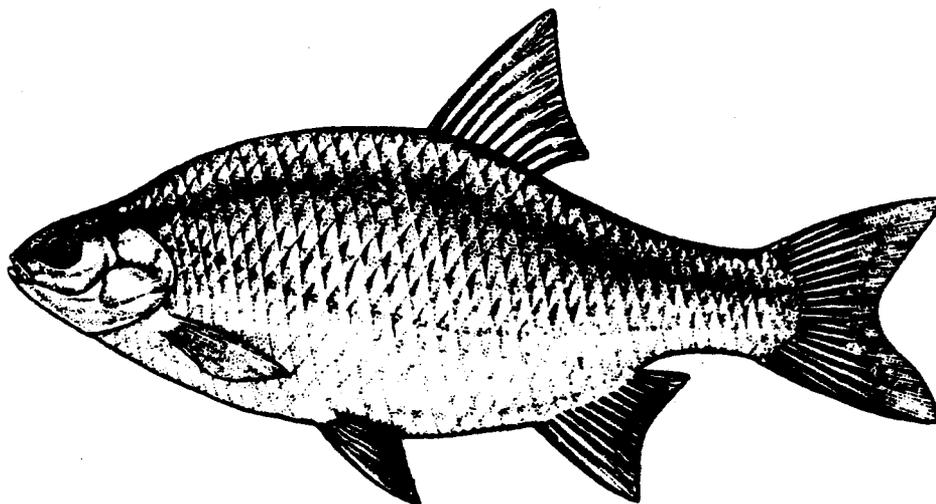
36-45 lateral scales; 9-11 dorsal rays; 10-11 anal rays; 10-13 rakers on first gill arch; pharyngeal teeth 3,5-5,3.

### **Expansion**

This species is being marketed as a bait minnow, and could turn up anywhere in the state.

### **Impact on Illinois**

Thus far, the Rudd has had no impact on Illinois, if it becomes established it will compete with native minnows and otherwise alter our aquatic ecosystems.



## Clupeidae

## Key to herrings and shads

1. Last ray of dorsal fin not elongated; pectoral fins not extending to pelvic fin insertion; 18 or fewer anal rays ..... 2  
 Last ray of dorsal fin of the adult elongated into a filament; pectoral fins extending posteriorly to or beyond pelvic fin insertion; 19 or more anal rays ..... 4
2. Lower jaw projecting far beyond snout; 20-24 rakers on lower limb of first gill arch (skipjack herring) ..... *Alosa chrysochloris*  
 Lower jaw equal to or projecting only slightly beyond snout; 39 or more rakers on lower limb of first gill arch ..... 3
3. Cheek decidedly deeper than long; 42-48 rakers on lower limb of first gill arch; no jaw teeth (Alabama shad) ..... *Alosa alabamae*  
 Cheek longer than deep; 39-41 rakers on lower limb of first gill arch; teeth on lower jaw (alewife) ..... *Alosa pseudoharengus*
4. Mouth terminal; snout pointed; 40-48 lateral-line scales; 17-27 anal rays (threadfin shad) ..... *Dorosoma petenense*  
 Mouth inferior; snout blunt; 52-70 lateral-line scales; 25-36 anal rays (gizzard shad) ..... *Dorosoma cepedianum*

*Alosa pseudoharengus*, alewife

### **Origin and Range**

The alewife is native to the Atlantic Ocean and streams of the Atlantic coast of North America. This species was found in Lake Michigan in 1949 and became extremely abundant in the 1950's and '60's after populations of native predators had been severely reduced by the sea lamprey. The alewife population declined subsequent to the introduction of several large predaceous salmon and trout into Lake Michigan. Presently, alewives are common in Lake Michigan, but not abundant as they were 25 years ago. This species is not found elsewhere in Illinois.

### **Biology**

Alewives are anadromous in their native range, but Illinois populations reproduce in the main body of Lake Michigan. This extremely prolific fish reaches sexual maturity in 3 to 4 years and spawns in late spring (Smith 1979). Massive die-offs can occur in Lake Michigan where the population of alewives is large. Maximum size is 15 inches (38 cm); normal adult size is 10 inches (25 cm).

### **Diagnostic Counts**

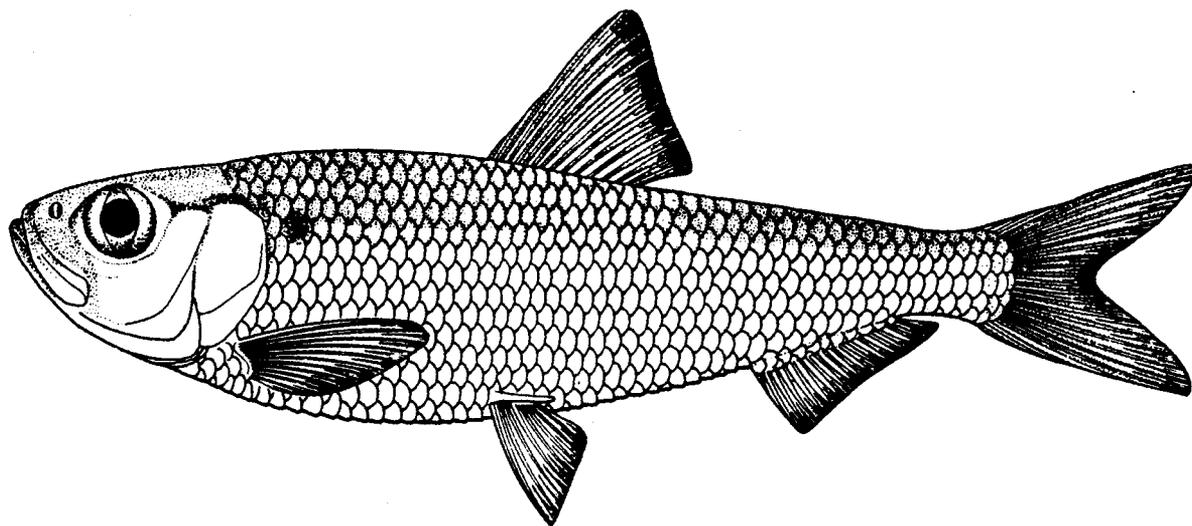
39-41 rakers on lower limb of first gill arch; 12-16 dorsal rays; 15-19 anal rays.

### **Expansion**

The distribution of alewives in Illinois is not expected to change.

### **Impact on Illinois**

In the late 1960's massive die-offs of alewives occurred causing nuisance conditions near the shores of the lake. Alewives have contributed to the decline of several native planktivorous salmonids of Lake Michigan. This species has been commercially harvested for use as fertilizer and pet food.



*Dorosoma petenense*, threadfin shad

### Origin and Range

The threadfin shad is native to the streams of the southern U. S., Mexico and Central America. Introduced into TVA reservoirs in the 1940's and '50's, this species spread north and was first found in Illinois in 1957 (Smith 1979). By 1979 it was established and commonly captured from the Ohio River, and was present in other streams in extreme southern Illinois. In recent years the threadfin shad has spread further and is now reproducing and abundant in the Illinois River.

### Biology

An open water planktivore, threadfin shad often feed in large schools over sand or mud. Eggs are broadcast in large quantities over debris and vegetation in the spring and fall. Sexual maturity is often reached in less than one year (Smith 1979). In an Arkansas study, Strawn (1965) found that temperatures below 41 °F were lethal to threadfin shad. As a result, large die-offs can occur when water temperatures decrease. Maximum size is 9 inches (23 cm); adults commonly reach 5 inches (13 cm).

### Diagnostic Counts

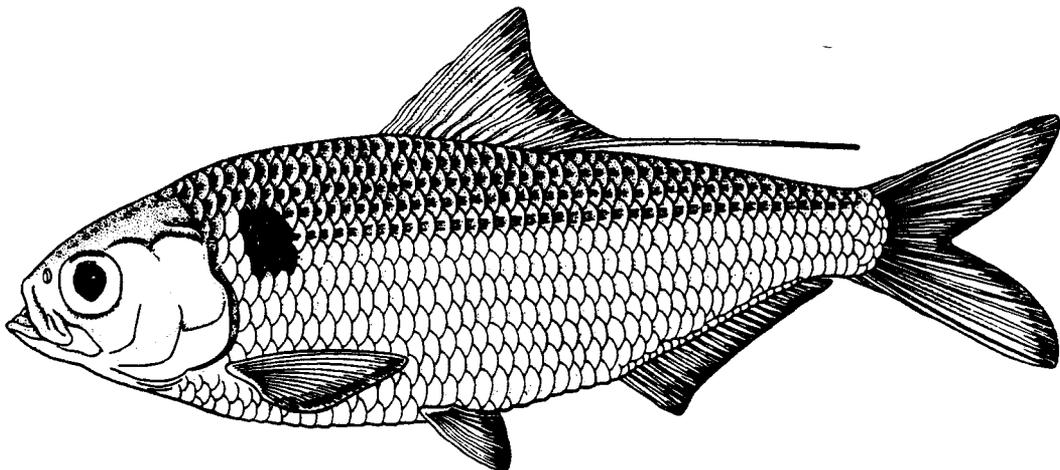
40-48 lateral scales; 10-14 dorsal rays; 17-27 anal rays.

### Expansion

Threadfin shad have already infiltrated the large rivers of the southern half of the state and are also present in the Illinois River. Their intolerance of cold will probably prevent them from becoming common in northern Illinois.

### Impact on Illinois

Threadfin shad feed on plankton and are very prolific, giving them the potential to deplete populations of these organisms. Other plankton feeding fish, including the fry of Illinois species, can be adversely affected. Threadfin shad are utilized as forage by large predators and are often stocked in reservoirs for this purpose.



## Atherinidae

## Key to silversides

1. Long beaklike snout (1 1/2 times eye diameter); first dorsal fin origin above anal fin origin; 74-87 lateral scales, 22-25 anal rays (brook silverside) . . . . .  
..... *Labidesthes sicculus*
- No beaklike snout (snout length equal to eye diameter); first dorsal fin origin in front of anal fin origin; 36-44 lateral scales; 16-18 anal rays (inland silverside) . . . . . *Menidia beryllina*

*Menidia beryllina*, inland silverside

**Origin and Range**

Native to the Atlantic and Gulf coasts of the U. S. and the lower Mississippi River, the inland silverside has been widely introduced as a forage species for game fish. Smith (1979) mentioned only that this species had been captured in Illinois after he finished writing his book. The inland silverside has been stocked in Lake Baldwin; Randolph/St. Clair counties, Lake of Egypt; Jackson/ Williamson counties and Rend Lake; Franklin/ Jefferson counties. Collections from Illinois waters include those from the Cache River, lower Mississippi and Ohio rivers and from the Kankakee River system in Will County.

**Biology**

Primarily a marine species, the inland silverside often ascends rivers where it inhabits clear, quiet water and consumes invertebrates. In a study of an inland population in Oklahoma, females produced up to 2000 eggs per day during the three month breeding season (Hubbs 1982). Spawning occurs from late March or April through July in Arkansas (Robison and Buchanan 1990). Inland silversides are usually found near the surface. Maximum size is 6 inches (15 cm).

**Diagnostic Counts**

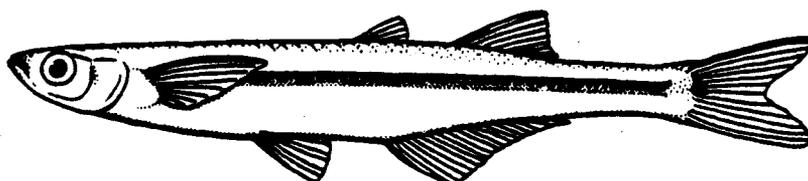
36-44 lateral scales; 15-20 anal rays; 4-5 spines in first dorsal fin; 8-10 rays in second dorsal fin.

**Expansion**

Illinois reproduction of this species is likely in light of its abundance in the Ohio River. This species is increasing its range in the Mississippi River drainage south of Illinois (Robison and Buchanan 1990) and individuals collected from the extreme southern tip of Illinois are probably a result of this expansion. In other states, stocked inland silversides have become established and abundant and will probably do so in Illinois.

**Impact on Illinois**

Presently the inland silverside appears to have had little effect on other Illinois species. Introduced populations of this species elsewhere have become large. If the inland silverside becomes abundant in Illinois it could alter aquatic ecosystems by depleting populations of invertebrates such as crustaceans and insects.



## Cichlidae

The only cichlid in Illinois is the introduced Rio Grande cichlid

*Cichlasoma cyanoguttatum*, Rio Grande cichlid

### Origin and Range

This species ranges from northeastern Mexico to southern Texas and is the only cichlid native to the United States. It has been observed establishing territories in Powerton Lake, at Pekin, Illinois and is presumably reproducing (Burr 1991). Rio Grande cichlids were probably introduced into the lake by an aquarist.

### Biology

The Rio Grande cichlid is a substrate spawner known to exhibit territoriality and parental care of eggs and fry. This species is omnivorous and prefers warm, sluggish, vegetated waters (Birkhead 1980). Adults commonly reach about 6 inches (15 cm) but occasionally become as large as 12 inches (30 cm).

### Diagnostic Counts

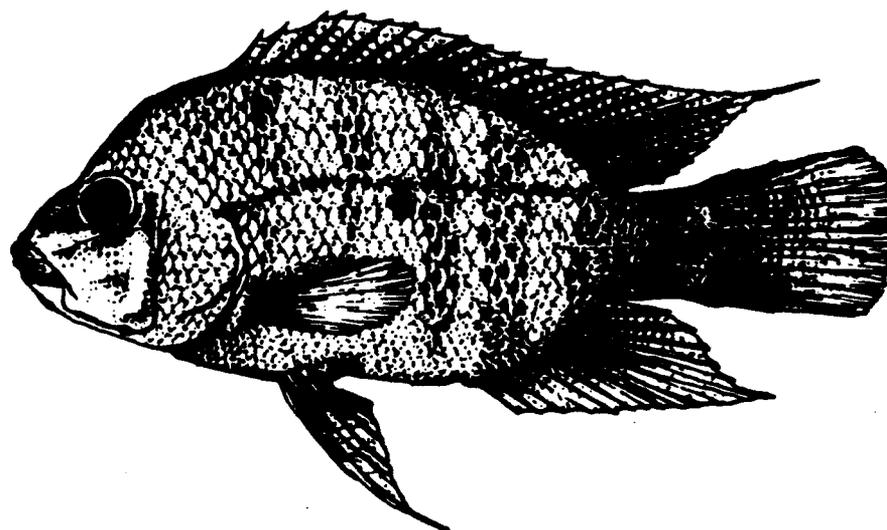
5-7 anal spines; 9-10 anal rays; 15-17 dorsal spines; 10-12 dorsal rays.

### Expansion

This sub-tropical species is able to survive in Illinois only because of heated power plant effluents and is not expected to expand its range in Illinois.

### Impact on Illinois

The Rio Grande cichlid is expected to have no impact on native fishes.



## Moronidae

## Key to temperate basses

1. No dark stripes along side of body (young have interrupted dark lines, bars on side); body deepest under first dorsal fin (white perch) .....  
 ..... *Morone americana*  
 Dark stripes along side of body; body deepest between dorsal fins ..... 2
2. Black stripes on silver-yellow side; stripes broken and offset on lower side;  
 second anal spine about as long as third; no teeth on tongue (yellow bass)  
 ..... *Morone mississippiensis*  
 Gray stripes on silver-white side; stripes not offset on lower side; second anal  
 spine distinctly shorter than third; teeth on rear of tongue ..... 3
3. Deep body strongly arched behind head; to 18 inches (45 cm) in total length  
 (white bass) ..... *Morone chrysops*  
 Smoothly arched dorsal profile; to 79 inches (2 m) in total length (striped bass)  
 ..... *Morone saxatilis*

*Morone americana*, white perch

### **Origin and Range**

In recent years the white perch has invaded the western Great Lakes from its native range of Lake Ontario and the Atlantic Slope drainages of northern North America. By 1988 the white perch had reached the Illinois waters of Lake Michigan as indicated by a capture from Belmont Harbor in Chicago (Savitz et. al. 1989). Recently white perch have been captured from the Calumet River drainage and from the Illinois River. Today the Illinois range of the white perch includes the Illinois River, and Lake Michigan and its tributaries.

### **Biology**

Primarily a brackish water species, the white perch is also found in river pools over mud. White perch spawn in large groups in shallow water where each female releases 20,000 to 300,000 adhesive eggs (Scott and Crossman 1973). Juveniles consume invertebrates, while adults are piscivorous (Smith 1985). Maximum size is 23 inches (58 cm); adults commonly reach 7 inches (18 cm).

### **Diagnostic Counts**

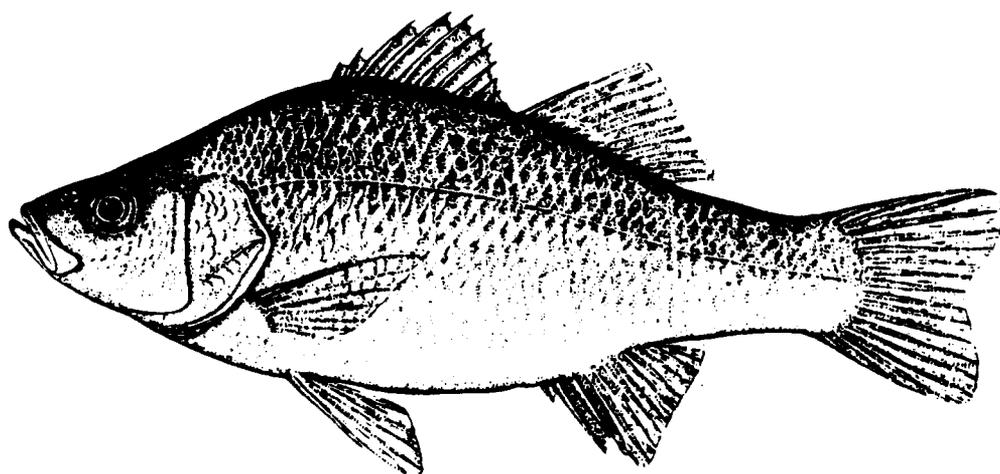
9 spines in first dorsal fin; 1 spine and 11-14 rays in second dorsal fin; 3 anal spines; 9-10 anal rays.

### **Expansion**

White perch have been present in Illinois for only a few years, yet there is already evidence of reproduction in the Illinois River. This species is likely to become statewide in distribution.

### **Impact on Illinois**

White perch are considered game fish in some areas and they might be promoted as such in Illinois. Their effect on Illinois ecosystems depends largely on their future abundance. If they become more common in Illinois they will compete with native predators, such as other basses.



*Morone saxatilis*, striped bass

### **Origin and Range**

The striped bass is an anadromous species native to the eastern coast of North America. This widely introduced species first appeared in Illinois in 1974 as an escapee from impoundments in western Kentucky (Smith 1979). Today striped bass are regularly captured from the Mississippi and Ohio rivers and several captures have been reported from the Illinois river.

### **Biology**

This large fish is almost exclusively piscivorous and is known to form schools. The buoyant eggs of striped bass require current and will not hatch in reservoirs, but an established population in the Arkansas River (Robison and Buchanan 1990), indicates that it is possible for inland reproduction to occur. Striped bass can become very large, often exceeding 1 meter in length and occasionally reaching 2 meters (79 inches).

### **Diagnostic Counts**

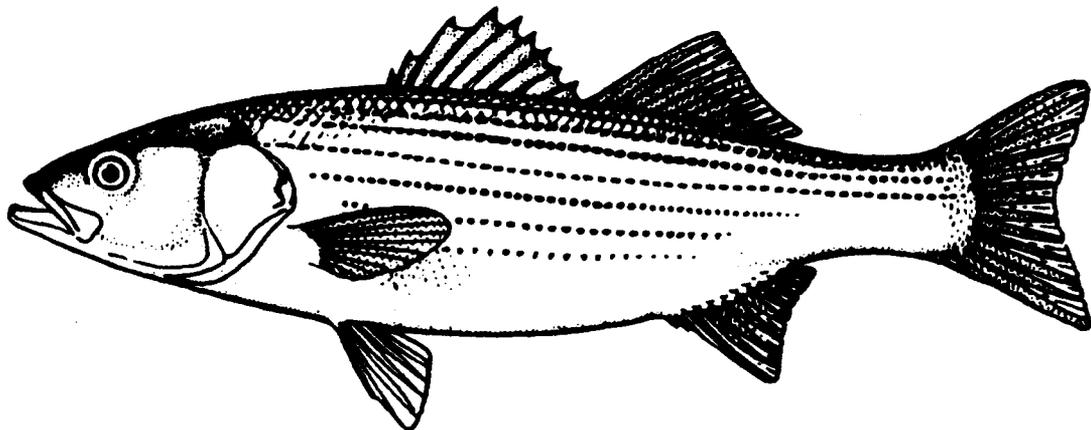
9 spines in first dorsal fin; 1 spine and 11-14 rays in second dorsal fin; 3 anal spines; 9-13 (usually 11) anal rays.

### **Expansion**

Illinois reproduction of striped bass occurs in Illinois waters of the Ohio River where young have been collected in great number (Brooks Burr pers. comm.). Reproduction in other Illinois rivers has not been documented, but the potential exists for this species to become established in large rivers statewide.

### **Impact on Illinois**

Striped bass attain a very large size and are highly sought after gamefish. However, their predation on other fishes, including other game species, could have unpredictable and undesirable effects on fish communities. Presently striped bass are not common enough in Illinois to be an important game fish or to have caused noticeable effects on other Illinois species.



### Acknowledgements

Dr. Brooks M. Burr provided numerous distributional records from the Southern Illinois University at Carbondale (SIUC) Fish Collection and provided editorial comments on the manuscript.

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