Fashion a Fish

Timing
Any time, best after "Pour a Pond."

Duration
About 30 minutes.

Location
Indoors or outdoors if not too windy.

Life Skills
Contributions to a group effort, communication, decision-making, cooperation, critical thinking, sharing, social skills.

OBJECTIVES

Participants will be able to:

- Classify fish according to body shape and coloration.
- Describe adaptations of fish to their environments.
- Describe how adaptations can help fish survive in their habitat.
- Interpret the importance of adaptations in animals.
- Learn to be better anglers by using lures, baits and other gear designed for various adaptations of fish.

Age/Stage
Fry, fingerling, young adult.

Across the Curriculum
Science, art.

Correlations
Science:

Art:

Background
The major purpose of this activity is for participants to investigate the concept of adaptation in fish. An adaptation is a feature that increases the animal's likelihood of surviving and reproducing in their habitat. Aquatic animals are the products of countless adaptations over long periods of time.

When a habitat changes, either slowly or catastrophically, the species of animals with adaptations that allow them many options are the ones most likely to survive. Some species have adapted to such a narrow range of habitat conditions that they are extremely vulnerable to change. They are over-specialized and are usually more susceptible than other animals to death or extinction.

In this activity, the participants design a kind of fish. They draw pictures of the adaptations that their fish will have. As these adaptations become part of the fish's design, the fish becomes better suited to the habitat in which it lives. Because of the variety of conditions within each habitat, many different fishes can live together and flourish. This is important to the angler. As one learns particular adaptations of the fish they pursue and about the habitat where these adaptations occur, they can adjust their fishing method or technique. Some adaptations of fish are shown in the table following this activity.

FRIENDS INVOLVED IN SPORTFISHING HERITAGE

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Materials

- Adaptation cards (one from each of the five categories, for each group) **Note:** Body shape and coloration are the only cards needed for younger participants.
- Colored markers (4–5 sets of a variety of colors)
- Paper (newsprint size is best)
- Photos or drawings of a variety of Michigan fish (available from Project F.I.S.H.)

Procedure

1. Ask the participants to draw a kind of animal that has a special adaptation; for example, long necks on giraffes for reaching high vegetation to eat, large eyes set into feathered cones in the heads of owls to gather light for night hunting.
2. Conduct a group discussion on the value of different kinds of adaptations to animals.
3. Pool all of the drawings of adaptations. Categorize them into the following groups:
   - protective coloration and camouflage.
   - body shape/form.
   - mouth type/feeding behavior.
   - reproduction/behavior.
   - other (one or more categories the participants establish, in addition to the four above that will be needed for the rest of the activity).

Note: The first three steps are optional for younger participants. The remaining steps need only include the adaptation cards for body shape and coloration; reproduction and mouth and fin type cards are optional for younger students.

4. Divide the adaptation cards into five groups of five cards each, one each of coloration, mouth type, fin type, body shape, and reproduction.
5. Pass one complete set of cards to each group of participants. There might be five groups with four to six participants in each group. If the group size is larger than about 30, make additional sets of adaptation cards.
6. Ask the participants to "fashion a fish" from the characteristics of the cards in the set they receive. Each group should:
   - Create an art-form that represents their fish.
   - Name the fish (common name and scientific name).
   - Describe and draw the habitat for their fish.
   - Design and describe what it would take to catch this fish.
7. Ask each group to report to the rest of the group about the attributes of the fish they have designed, including identifying and describing its adaptations. Ask the participants to describe how this kind of fish is adapted for survival.
8. (Optional) Now that the participants have some knowledge of adaptations, place the fish photos/drawings (these should be the same size photos/drawings or put onto cards of the same size) on the floor or table and ask the participants to categorize them according to their adaptations. See if they can get them into proper families, and have them describe how and where these fish may feed. This part of the activity is optional or may be done as a separate activity.
9. Playing the game "Concentration" or "Memory" can be done to reinforce what has been taught in this activity. Simply create a second set of photos or cut the ones you have in half (this is the reason to have the photos/drawings on the same size cards) and mix them upside down in columns and rows. Have the participants flip over two to find a match, if no match is found these two are turned back over for the next player's turn. If a match is found the player finding the match gets another turn. This will truly enhance the observation skills of any age group.

Tips for Success

Make sure that all of the participants are providing input to the drawing. Visit each of the groups to see if they need additional information or assistance, especially for younger participants.

Adaptation

- Have the groups create a three-dimensional fish with the particular adaptations out of scrap materials you make available. These can then be made into a display about adaptations.
- Visit a Creation Station in your community to pick up recyclable materials.
- See "Mixed Creel" for "Smash Can Fish."
- Use one card from a set and have participants find photos of fish with that particular adaptation.

Extensions/ Additional Resources

- Invite a taxonomist from a local college or state or federal agency to speak at a future meeting.
- Contact a local charter, commercial fisherman, biologist, or even a taxidermist to have them provide a variety of fish species for your group to examine.

Community Service

Visit a local senior center, school, or club function and do the activity with them. It is fun for all ages.

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As anglers and good natural resource stewards, it is our duty to pass on our knowledge.

Exhibits/Sharing

Create three-dimensional and poster fish for a local public area. This is a great fair project for both school and 4-H or club events.

Career Opportunities

Taxonomist, taxidermist, artist or cartoonist, biologist.

Source

Adapted by Mark Stephens, MSU Fisheries and Wildlife Department, from *Aquatic Project Wild—Aquatic Education Activity Guide.*

Adaptation	Advantage	Examples of Fishes from Great Lakes Watersheds
Mouth		
Sucker-shaped mouth	bottom feeds on very small animals	sucker, carp
Elongated upper jaw	feeds off bottom	sturgeon
Sucking disk	attaches to prey/substrate	sea and brook lamprey
Duckbill, elongated jaws	grasps prey	pike, muskellunge, gar
Extremely large, flexible jaws	surrounds prey	largemouth bass
Body Shape		
Torpedo shape	fast moving away from bottom	trout, salmon
Flat-bellied	bottom-oriented swimmer	catfish, sucker
Vertical disk	feeds above or below in slow water	bluegill, pumpkinseed
Wide/horizontally flattened	bottom dweller	sculpin, sturgeon
Long and slender, scaleless	attached feeder, needs low resistance	lamprey
Coloration		
Light-colored belly	predators have difficulty seeing it from below	most minnows, perch
Dark upperside	predators have difficulty seeing it from above	bluegill, bullhead, catfish
Vertical stripes	can hide in vegetation	muskellunge, bluegill, yellow perch
Horizontal stripes	can hide in vegetation	white bass
Mottled coloration	can hide in rocks and on bottom	trout, rock bass, darters
Reproduction		
Eggs deposited on bottom	hidden from predators	trout, salmon, minnows
Eggs deposited in nests	protected by adult males	bluegill, bass, stickleback
Floating eggs	dispersed in high numbers	freshwater drum
Eggs attached to vegetation	stable until hatching	perch, northern pike, carp
Live bearers	high survival rate	guppy, mosquito fish, *Gambusia* (no native Michigan species)
Fin Shape/Location		
Large pectoral/pelvic fins	help stay on bottom in moving water	johnny and rainbow darters
V-shaped tail	continuous movement	channel catfish, rainbow smelt
Anal and dorsal fins—posterior	burst speed power	pike, muskellunge, gar
Anal and/or dorsal spines	protection from predators	sunfish, stickleback
Pectoral fins on side	good for sharp turns and "rowing"	sunfish, black bass, yellow perch
Pectoral fins on bottom	good for stabilizing in flowing water	trout, suckers
Long dorsal fin	used for propelling forward or backward without body movement	bowfin

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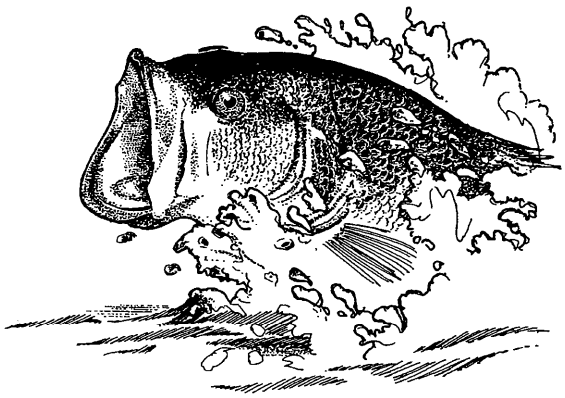
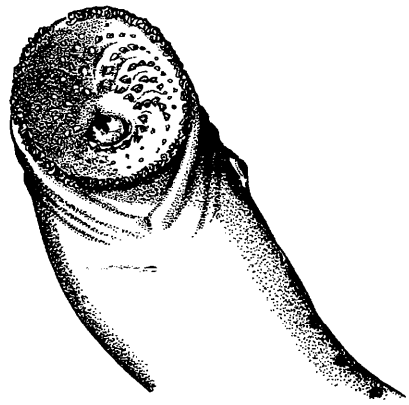
ADAPTATION CARDS

MOUTH/FEEDING



Very Large Flexible Jaw
(Largemouth Bass)

MOUTH/FEEDING

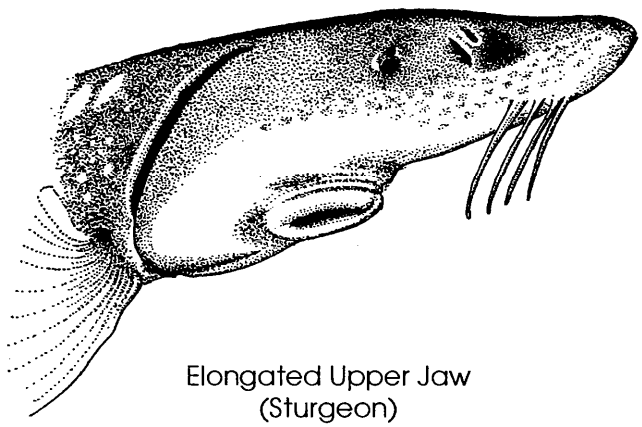


Sucking Disks
(Lamprey)

MOUTH/FEEDING

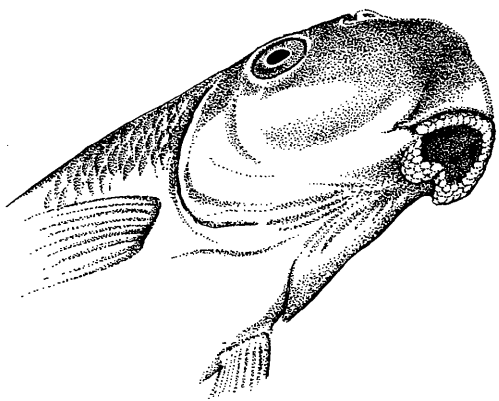
Duckbill Jaws
(Northern Pike)

MOUTH/FEEDING



Elongated Upper Jaw
(Sturgeon)

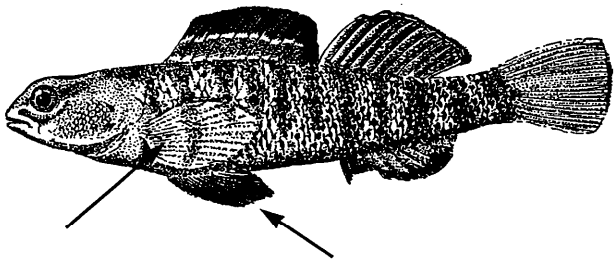
MOUTH/FEEDING



Sucker Shape
(Sucker)

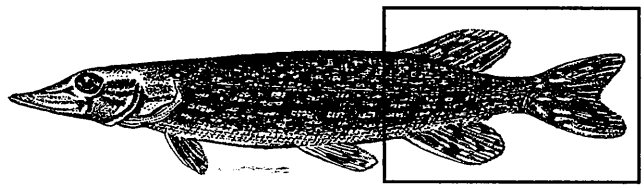
ADAPTATION CARDS

FIN SHAPE AND LOCATION



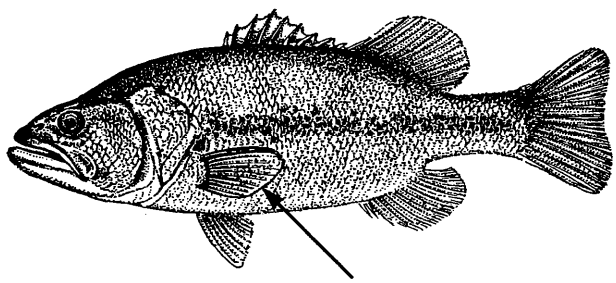
Large Pectoral or Pelvic Fins
(Rainbow Darter)

FIN SHAPE AND LOCATION



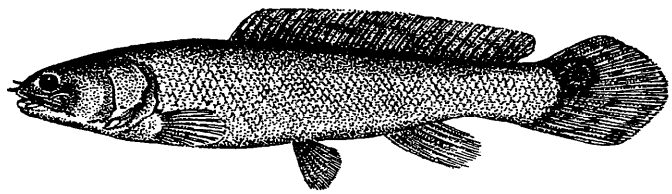
Anal and Dorsal Fins Posterior
(Northern Pike)

FIN SHAPE AND LOCATION



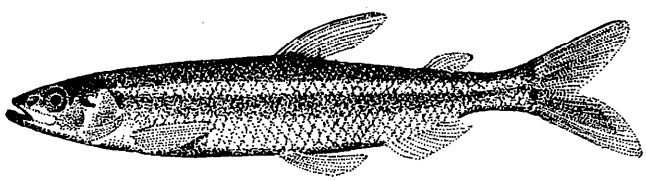
Pectoral Fins on Side
(Largemouth Bass)

FIN SHAPE AND LOCATION



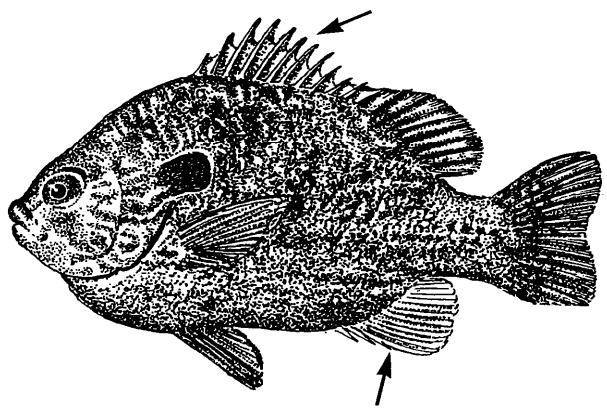
Long Dorsal Fin
(Bowfin)

FIN SHAPE AND LOCATION



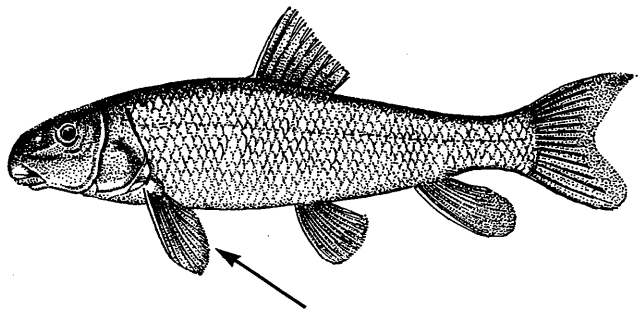
V-Shaped Tail
(Rainbow Smelt)

FIN SHAPE AND LOCATION



Anal and/or Dorsal Spines
(Sunfish)

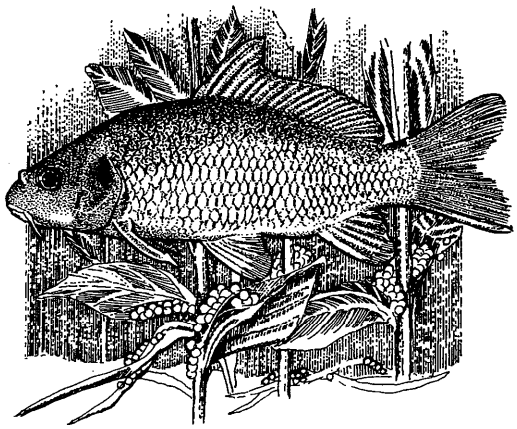
FIN SHAPE AND LOCATION



Pectoral Fins on Bottom
(Sucker)

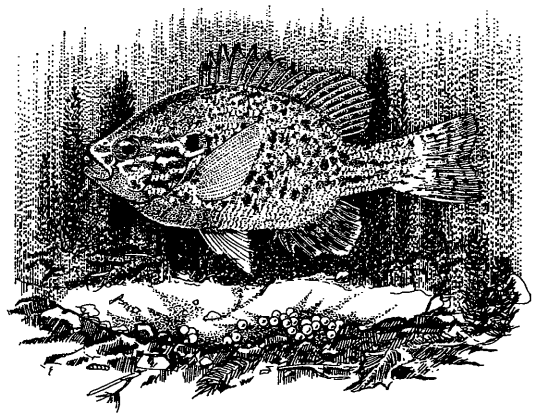
ADAPTATION CARDS

REPRODUCTION



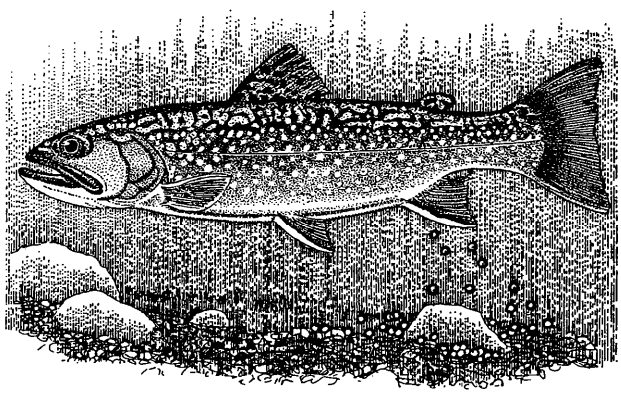
Eggs Deposited in Vegetation
(Carp)

REPRODUCTION



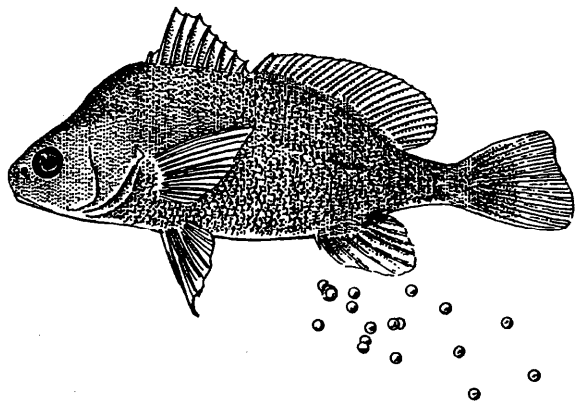
Eggs Deposited in Nest
(Pumpkinseed)

REPRODUCTION



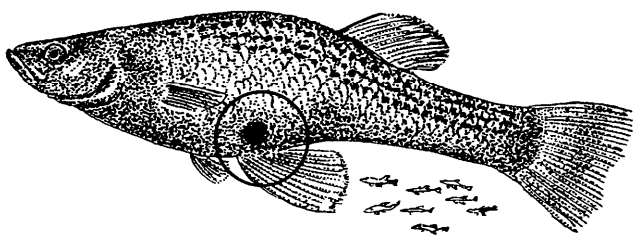
Eggs Deposited on Bottom
(Trout)

REPRODUCTION



Free-Floating Eggs
(Freshwater Drum)

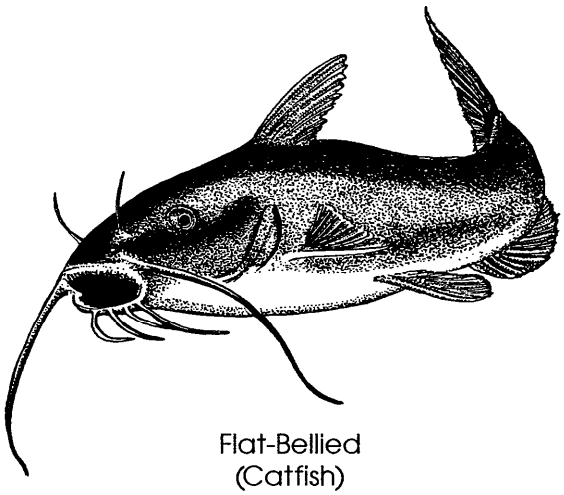
REPRODUCTION



Live Birth
(Gambusia)

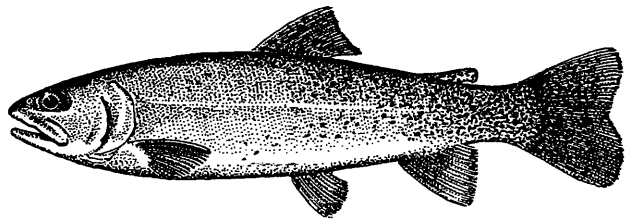
ADAPTATION CARDS

SHAPE



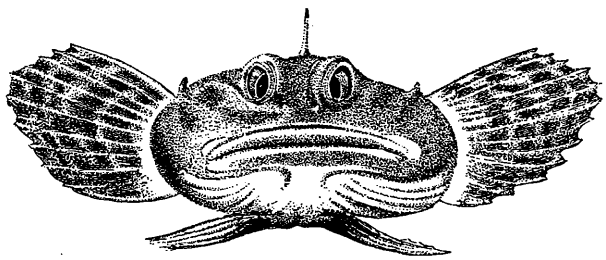
Flat-Bellied
(Catfish)

SHAPE



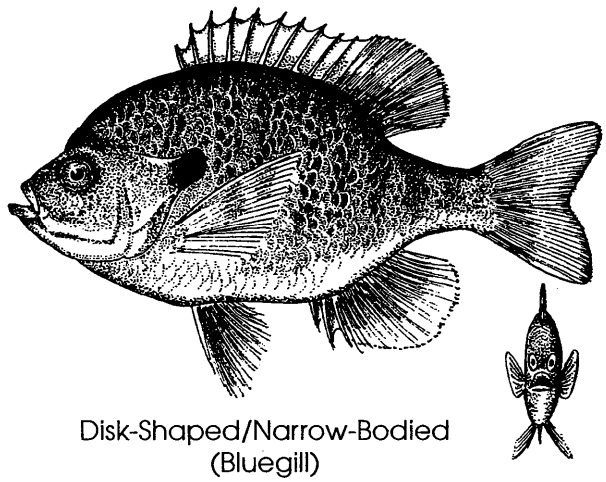
Torpedo Shape
(Trout)

SHAPE



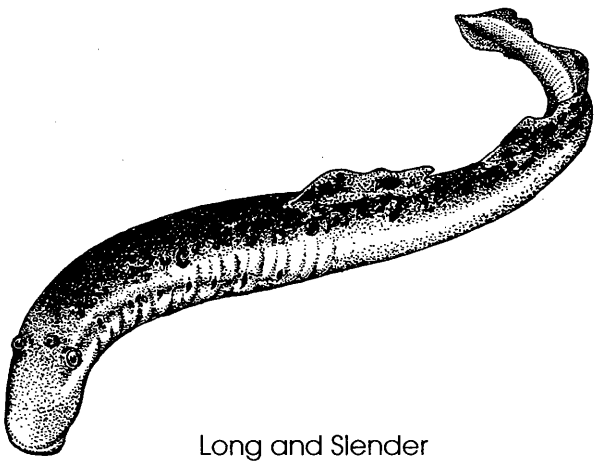
Horizontally Flattened
(Sculpin)

SHAPE



Disk-Shaped/Narrow-Bodied
(Bluegill)

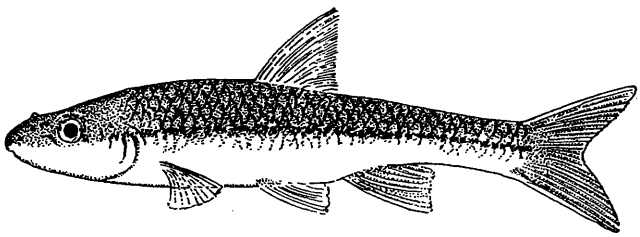
SHAPE



Long and Slender
(Lamprey)

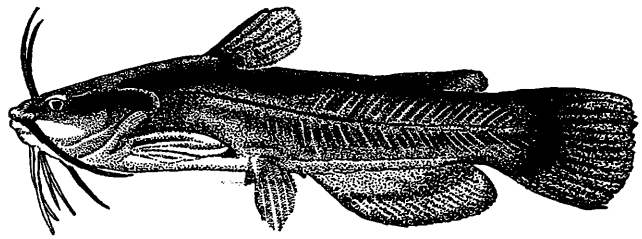
ADAPTATION CARDS

COLORATION



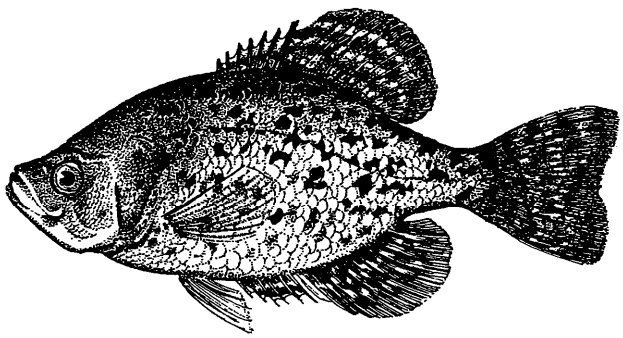
Light-Colored Belly
(Most Minnows)

COLORATION



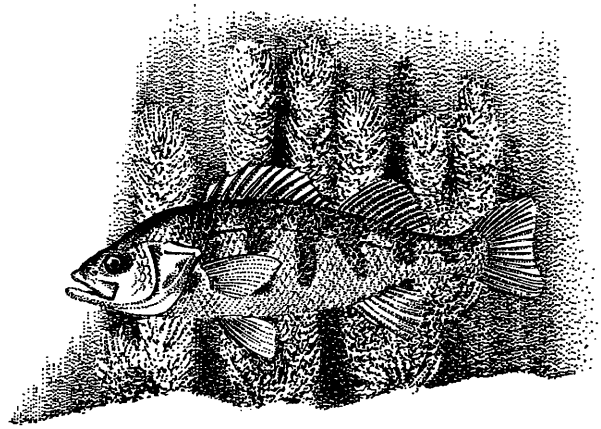
Dark Upperside
(Bullhead)

COLORATION



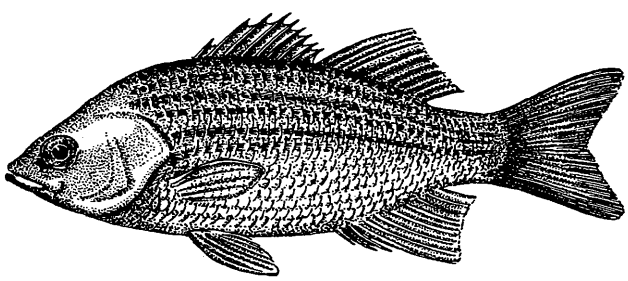
Mottled
(Crappie)

COLORATION



Vertical Stripes
(Yellow Perch)

COLORATION



Horizontal Stripes
(White Bass)