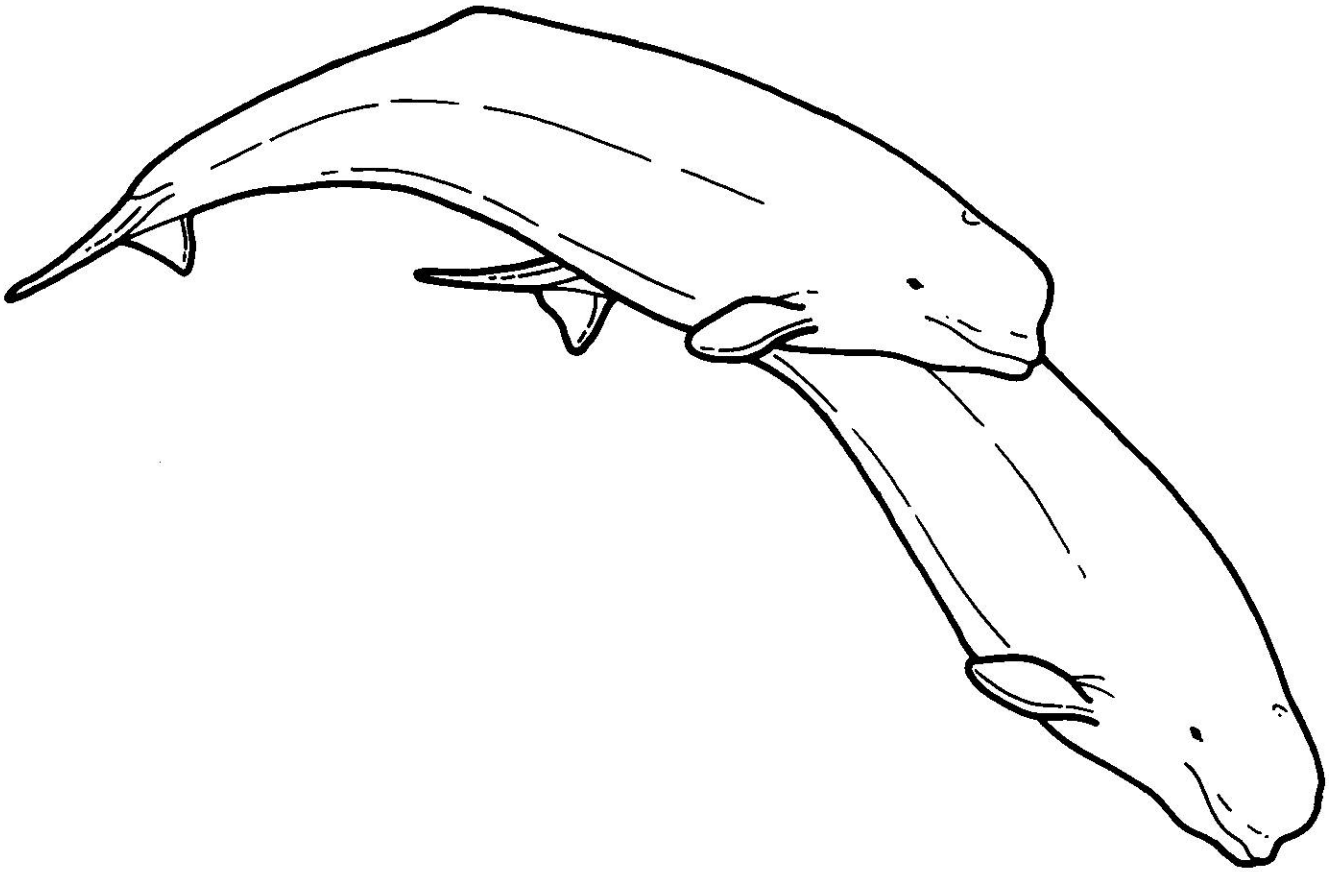
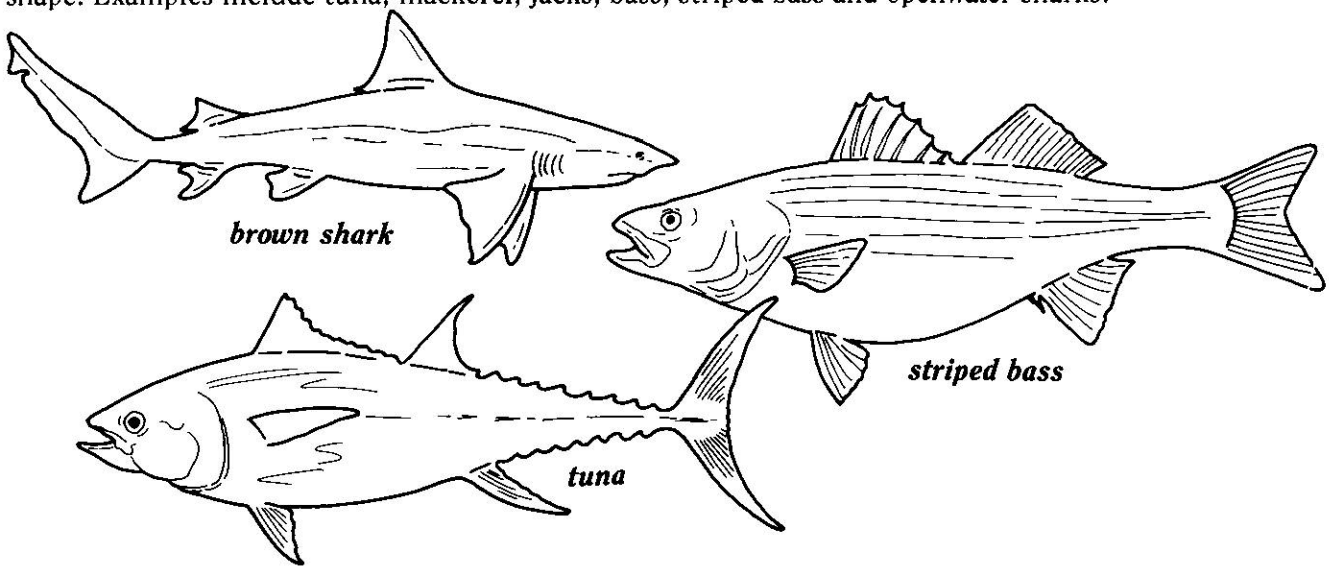


# MOVING THROUGH WATER: HOW FISH SWIM

Water is harder to move through than air. It resists movement more. Think of how hard it is to run through water. Fish must deal with this problem. There are many different solutions.

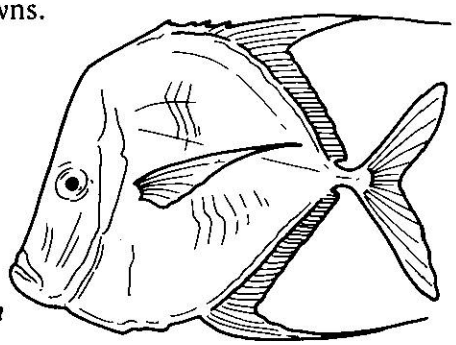
## BODY SHAPES

Some body shapes slip through water easily. The FUSIFORM or STREAMLINED body shape is extremely efficient for moving through water. Most free-swimming and fast-moving fish have this shape. Examples include tuna, mackerel, jacks, bass, striped bass and openwater sharks.



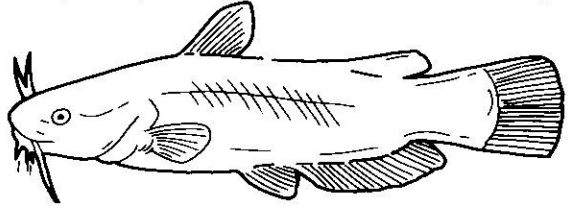

**LATERALLY COMPRESSED** fish are flattened from side to side. They are not as swift as fusiform fish, but still slide through the water well. Many laterally compressed fish live in relatively quiet waters such as ponds, lakes, or coral reefs, or they are schooling fish found in shallow open waters. This body shape, though not as fast as the fusiform shape, is well-designed for maneuvering in dense cover and making short, quick turns. Examples include pumpkinseeds, bluegills, sergeant majors, butterflyfish, triggerfish, pompano, and lookdowns.

The flounder is a laterally compressed fish which rests on the bottom. Both eyes are on one side of its head. One eye migrates to the other side during development.


*lookdown*

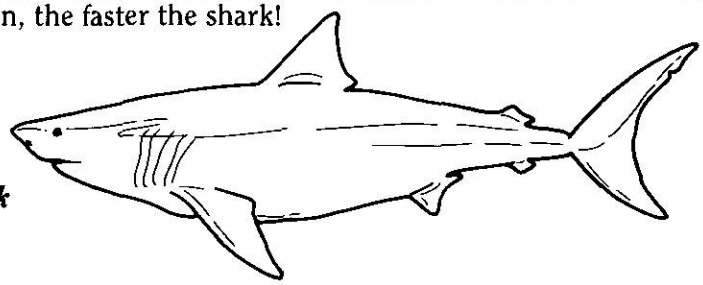
Bottom-dwelling fish very often have a **DEPRESSED** body shape such as skates, rays, sculpins, and catfish. They are flattened from top to bottom. As you might imagine from their shape and habitat, these may not be fast swimmers. Losses in swimming efficiency are offset by other protective adaptations such as coloration, and behaviors such as burrowing into the substrate.

Some kinds of fish have square or rounded shapes which force them to swim quite slowly. They generally have very good defenses against predators such as spines or poisons and eat slow moving prey. Puffers, porcupinefish and trunkfish are among these slow swimmers.


*catfish*

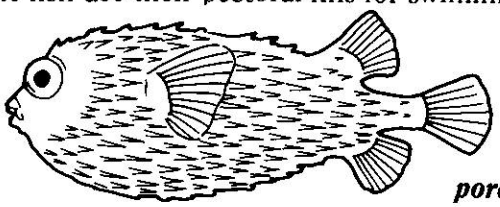
## FINS

The **CAUDAL FIN,** or tail fin, is of the greatest importance in most fish for swimming at sustained speeds, and for all fish where bursts of high speed are important. Among bony fish, those with a narrow connection of tail to body tend to swim constantly, while those with a broad base to their tail swim with brief bursts of speed. Sharks generally use their caudal fin for power. The interesting thing is that the size of the shark's second dorsal fin relates to its swimming speed. The smaller the second dorsal fin, the faster the shark!



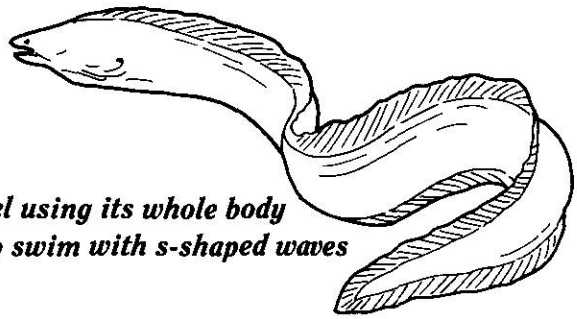
***great white shark***

The **PECTORAL FINS** and **PELVIC FINS** (each of which are paired), are important for climbing, diving, banking, turning, and stopping in those fish that swim with their caudal fins. Some fish use their pectoral fins for swimming too, paddling their way through the water.

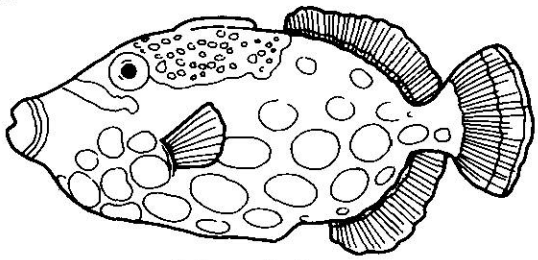


***porcupinefish***

The **DORSAL FIN** and **ANAL FIN** serve mainly as keels which keep the fish upright in the water. In some fish these fins also are used for swimming. Waves pass down both fins in a s-shape, pushing the fish through the water. Fish that swim this way can go backwards as well as frontwards which means they can easily swim in and out of cracks.

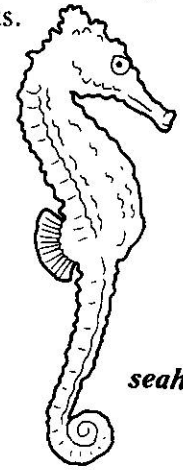


***eel using its whole body to swim with s-shaped waves***



***triggerfish***

The seahorse is unusual in that it swims upright, using its **DORSAL** and **PECTORAL FINS.** This slow way of swimming helps the seahorse hide among plants.



***seahorse***