# Chapter V. Fish

Fish are cold-blooded vertebrates that live in water, breathe with gills, and have fins rather than legs. Cold-blooded means their surrounding environment largely regulates their body temperature. There are 3 classes of fishes, the jawless fishes (lampreys and hagfishes), the cartilaginous fishes (sharks, skates, rays, and related fishes), and the bony fishes, which comprise 97% of the species. Fish are the most diverse vertebrate class with about 28,000 described species worldwide.

Fish vary tremendously in shape. In general, the head bears the eyes, nostrils, mouth, and gills. The head also can include the anus. Fish usually absorb oxygen from water through the gills. Some fish have modified swim bladders that they gulp air into, and absorb oxygen (you can watch gar coming to the surface and gulping). Other fish have no swim bladder. The mouths of fish can be angled upward or downward depending if the fish is a surface or bottom feeder. In most fish the body is covered with scales; in catfish there are none. Most fish secrete a layer of mucus that covers the entire body that protects them. A group that includes things like seahorses, stingrays, eels, batfish, and the strange things in the ocean's depths, it is hard to generalize.

Cave fish and some deep sea dwellers may be entirely white or colorless, but most fish have coloration that camouflages them from predators, or the prey they seek. Almost all fish have a darker top side than bottom side because the top will blend in with the darker water when looking from above and the lighter bottom side will blend in with the greater light when looking from below. Sexes sometimes have different color patterns.

Fish make use of a variety of sensory organs. Fish have inner ears for equilibrium and hearing. A lateral line, which is a series of fluid-filled canals extending along the body, is used by many fish to sense vibrations in the water; they can listen for prey, or predators. Fish have a sense of taste that might be used for final acceptance or rejection of food. The sense of smell is usually well-developed and helps in locating prey. Some fish can even produce a low-voltage electrical current around their body. When prey disturbs this current the fish can sense it. Electric eels can produce an electrical current strong enough to stun prey.

Some fish migrate, often between marine and freshwater environments. The eel in Florida is an example of a fish that will migrate from a marine environment to a freshwater environment to spawn. Other species live in freshwater but go to marine environments to spawn.

Fishes feed on every trophic level. The carnivores eat flesh Some fish filter feed, which means they strain plankton or other small organisms with their gills. Others are bottom feeders who use their mouths to suck up organic material from the bottom. Others are "cleaners" that eat debris and parasites from scales of larger fish. The mosquito fish is an insectivore because it feeds on mosquito larvae and provides an effective control on these insects.

Most bony fish lay their eggs externally where the sperm is deposited on them. Some fish can fertilize internally and produce live young. In general, species whose eggs have little chance to reach maturity lay the most eggs. Some fish, such as grouper, change their sex if there are not enough of the other sex to mate with.

Many species of fish will gather in schools. Schooling might allow prey fish to give the impression of a large animal to discourage predators, or perhaps more likely, to create a confusing target. Schooling also might facilitate locating food sources (when traveling fish join schools they are lead to food) and give ready access to mates. Large predator fish usually are solitary except for during breeding seasons.

Fish are good indicators of ecosystem health and water quality. Pollutants such as heavy metals, pesticides and fertilizers not only can directly kill fish, but some can be passed up food chains, even affecting terrestrial animals. Many lakes, stretches of rivers, and other bodies of water have such unsafe pollution levels, especially mercury, that the fish have been declared unsafe to eat by health agencies. As you can predict, predator fish have more bioaccumulation of mercury than other fish. Siltation is also a problem. Siltation intensifies when we disturb soils for agriculture, forestry, housing developments, roads, or other human activities. Another problem is the introduction of exotic species that out compete the native populations.

**New Mexico Cold Water Game Fish**

Rainbow Trout

Numerous black spots on light body. Pink streak along sides.

Brown Trout

Abdomen usually yellow, large black spots and red-orange spots with halos on sides.

Brook Trout

Light wavy lines on back. White edge on front of lower fins. Yellow spots and red spots with halos on sides.

Lake Trout

Light to dark green with white, irregular spots on head, body and most of tail. Indented tail fin.

Kokanee Salmon

**Female:** Bluish green along back, silvery sides.

Kokanee Salmon

**Spawning Male:** Long snout, arched back, sides turn pinkish red to orange.

Gila Trout (native)-protected

It is unlawful to possess Gila Trout.

Dark olive-green along back, shading to golden-yellow belly. Small black spots.

**New Mexico Warm Water Game Fish**

Smallmouth Bass

Uniform olive brown color, shallow notch between dorsal fins. Upper jaw extends to eye. Vertical barring.

Largemouth Bass

Scales on cheeks as large as on body. Deep notch between dorsal fins. Upper jaw extends beyond eye.

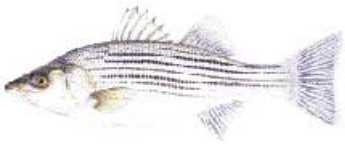
Spotted Bass

Scales on cheeks smaller than on body. Shallow notch between dorsal fins. Upper jaw extends to eye. Dark spots in rows. Dark horizontal irregular splotches on side.

Channel Catfish

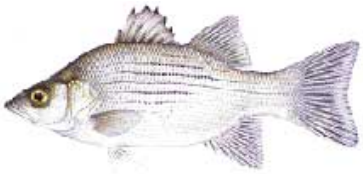
Long barbells about the mouth. Sharp dorsal and pectoral spines. Small, irregular black spots, no scales.

Striped Bass



Olive or blue black. Silvery sides with 7 to 8 stripes that extend onto tail. Slender body, up to 55 pounds.

White Bass



Deep body, seldom exceeds 3 pounds. Teeth in a single patch on back of tongue. Horizontal stripes less distinct on bottom half of body.

Walleye

Milky eye corneas; Large canine teeth. Two fins on back, dark area on first fin.

Northern Pike

Large mouth, sharp teeth; Top fin at back. Sides are gray-green with rows of yellow and white spots.

Crappie

Two dorsal fins joined, appearing as one. Deep bodied, large lower jaw. Olive or dark green back.