4-H MEMBER GUIDE

Unit 2

Grade 6

Agricultural Extension Service
The University of Tennessee

PB 1700

FISH AND FISHING IN TENNESSEE

Name _____

Club _____

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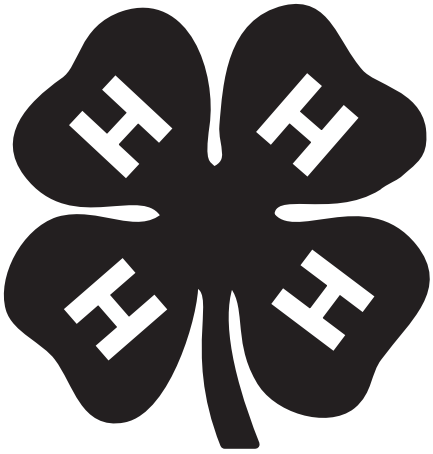
REQUIREMENTS

To complete project requirements for this manual in the 4-H Wildlife Project, you will need to:

- make a project plan
- give at least two talks or demonstrations about what you learned in this manual to your 4-H Club or other groups.

OBJECTIVES

You will learn about the kinds of fishes found in Tennessee, and how to know them. You also will learn ways you can catch them, the proper baits to use and about other animals that live with fishes.



FISH AND FISHING IN TENNESSEE

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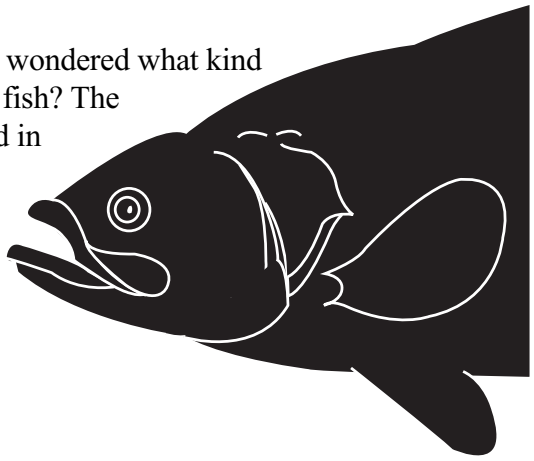
FISH AND FISHING

About this manual.....

How many times have you seen a fish caught or caught one yourself and wondered what kind it was? Have you ever thought about the other aquatic animals that live with fish? The purpose of this manual is to introduce you to the different kinds of fish found in Tennessee, other animals that live with them and ways you can catch fish!



You will learn about:

1. the kinds of fish found in Tennessee, and how to identify them,

2. other animals that live with fish, and

3. ways you can catch fish and the right baits to use.

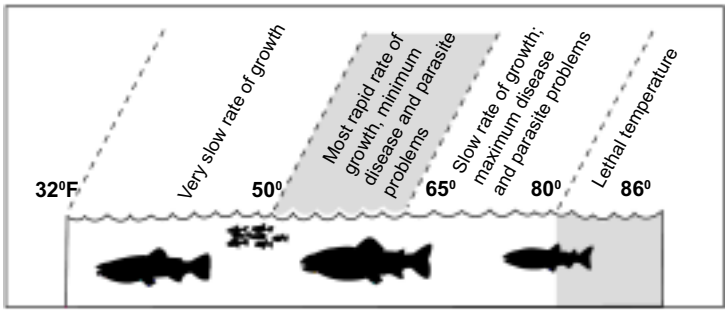
LEARNING ABOUT FISH AND FISHING

Most everyone who is interested in wildlife and the outdoors loves to fish, but half the fun of fishing is being able to identify what you have caught and understanding something about how a fish lives in an aquatic environment.

A **fish** needs **oxygen** to live, just as we do. But instead of getting it from the air, fish receive oxygen from the water that passes over their gills. **Gills** are filled with tiny blood vessels, and as water passes over them, the **dissolved oxygen** in the water is taken into the bloodstream.

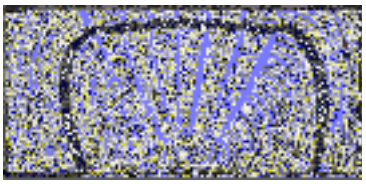
Another difference between fish and people is that fish are **cold-blooded**, which means their body temperature is about the same as the water around them. Because the water temperature of lakes and ponds changes throughout the year, some fishermen carry a thermometer with their fishing gear. By taking the temperature of the water, anglers may be able to tell whether or not the fish are biting, since fish are more active at certain temperatures than others. The chart below shows the effects of temperature on a commercial trout "farm."

Trout thrive and are most economically raised in water ranging from 50 to 65 degrees F.



Keep in mind these temperatures are for fish that prefer cooler water. Channel catfish, on the other hand, grow most efficiently at temperatures between 70 and 85 degrees F, and take little food at the temperature range best for trout growth.

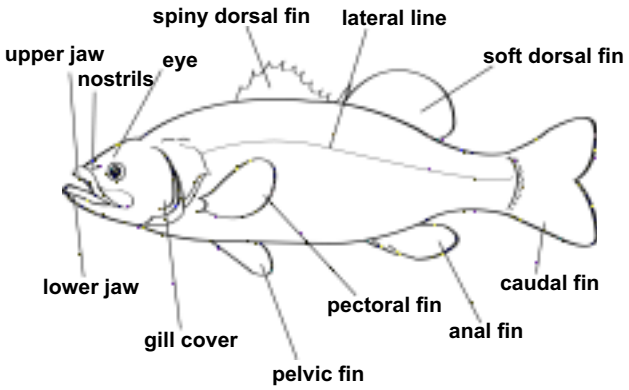
A protective coating covers the body of a fish, just as our skin covers us. Bass and bream have skin covered with hard **scales**, while catfish have tough, smooth skin. Scales grow as fish grow, and years are recorded on each scale as **annuli**, similar to the annual growth rings seen on a tree stump. In the summer when a fish is growing rapidly, the annuli are further apart. In winter, growth is slowed considerably and the annuli are closer together, giving the appearance of a darker line. Count the sites where the annuli are close together and you have the age of a fish. Fish without scales, like catfish, are aged by counting the annuli from sectioned spines. **Otoliths**, or **earstones**, are used to age some types of fish, but in order to extract otoliths, the fish must be killed.



Fish record their birthdays on their scales, much as a tree forms annual rings. Here, only one birthday has been recorded, as identified by the single heavy black line.

LEARNING THE PARTS OF A FISH AND THE KINDS FOUND IN TENNESSEE

Just as we move and do things with our arms and legs, fish move around using their muscles and **fins**. The fins and other parts of the fish are important to know when you are trying to identify the fish.

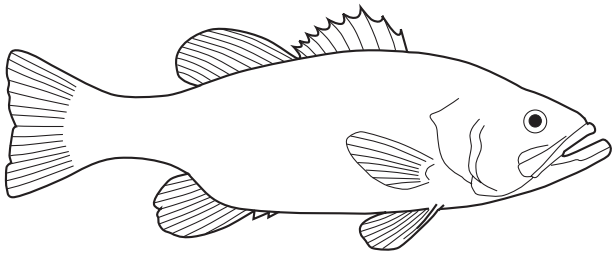


Sunfish Family

Sunfish have spiny fins and large, rough scales. They live in warm water, usually lakes, ponds or slow-moving streams and rivers. Members of the sunfish family include bass, bluegill and crappie.

Just as largemouth and smallmouth bass are usually just called "bass," bluegill and many other sunfish are commonly called "bream" (pronounced like the *brim* of your hat).

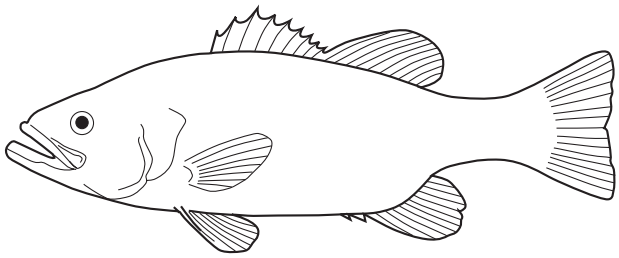
Largemouth Bass (*Micropterus salmoides)*



Largemouth bass are found in virtually every area of the South. They are commonly stocked in both public and private waters.

The back and sides of the largemouth bass are pale olive to silvery green. The various shades of color are often influenced by both water and bottom colors. The clearer the water, the darker the appearance of the fish. A broad, lateral black-to-brown stripe is located on the mid-side. The stripe can be either continuous or made up of a series of blotches. The end of the upper jaw comes back past the eye. None of the other bass have this characteristic.

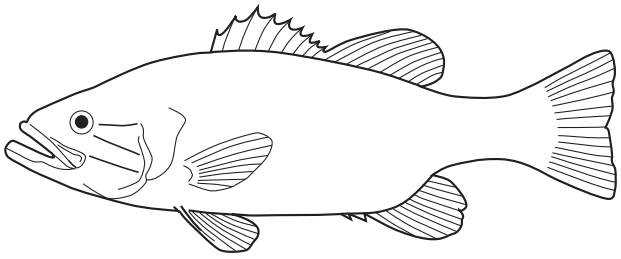
Smallmouth Bass (*Micropterus dolomieui*)



Smallmouth bass are found in clear, cool streams and some lakes and reservoirs in the South. They become more common the farther north you go.

The back and sides of the fish are dark olive to greenish or yellowish-brown. The sides of the fish may have faint dark vertical bars and dark lines across the cheeks. The absence of a noticeable lateral stripe on the sides distinguishes them from largemouth and spotted bass. The belly is white with dark spots of no particular pattern.

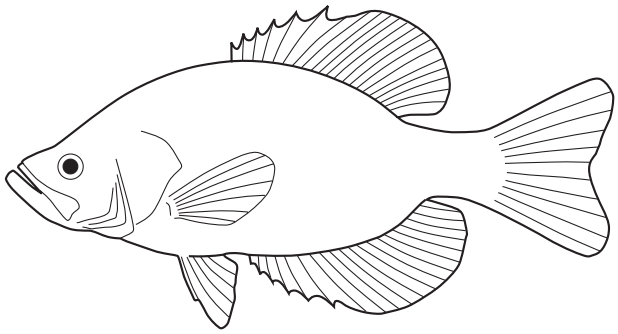
Spotted Bass *(Micropterus punctulatus*)



Spotted bass are found in rivers, streams and reservoirs of the Mississippi and Gulf Coast drainages. They also may be found in other waters because of stocking efforts, but are not very abundant there.

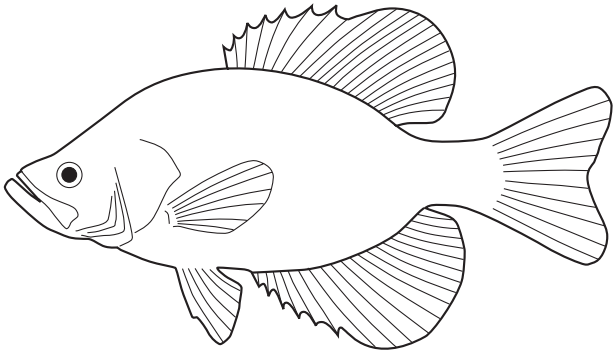
Natural coloration of spotted bass is similar to largemouth bass. However, spotted bass have dark stripes on their cheeks and longitudinal dark streaks on their lower sides.

White Crappie *(Pomoxis annularis)*



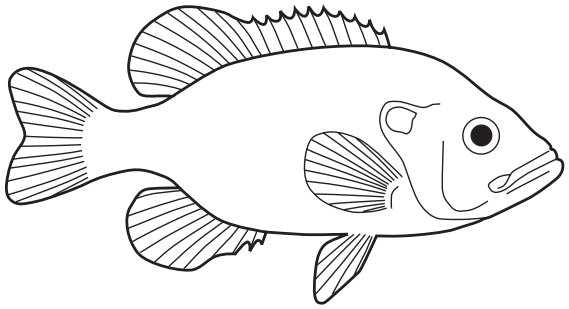
The white crappie is more common to waters west of the Appalachian Mountains. It is found in flood plain lakes, large river pools and reservoirs. It seems to prefer areas having considerable cover and deeper portions of open water in summer. White crappie are silver-white, with dark green to black vertical bars on their sides. Their mouths, when opened, are large and the jaws (maxillaris) are paper thin in appearance.

Black Crappie (*Pomoxis nigromaculatus)*



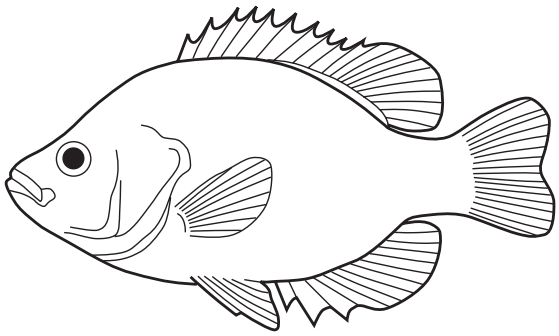
The black crappie is found throughout the South. It is very similar in appearance to the white crappie, but has irregular, dark green to black blotches instead of a pattern of dark vertical bars on its sides. Also, the black crappie has seven or eight **dorsal fin** spines, while the white crappie has only six spines. Black crappie seem to prefer clearer water than white crappie, and are perhaps more prevalent in northern waters.

Green Sunfish *(Lepomis cyanellus*)



The green sunfish is widely distributed from the Mississippi Valley to the Gulf Coast. It is becoming more common in other areas of the South in a variety of habitats. Green sunfish are olive to brassy green. They have emerald streaks on the side of the head and their fins are tipped in yellow or orange.

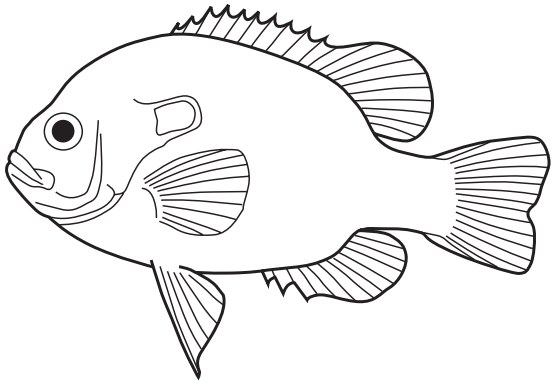
Spotted Sunfish *(Lepomis punctatus)*



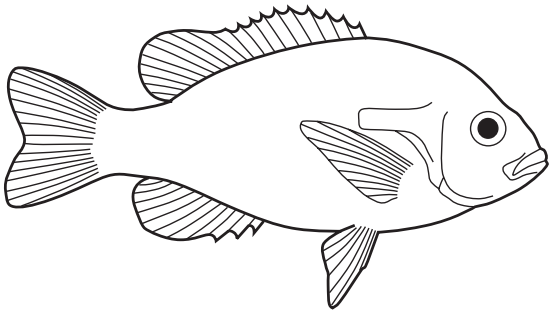
The spotted sunfish is found in flood plain areas and streams of the deep South. The fish is dark blue with a yellow cast. Spots at the base of each scale form horizontal rows on the sides. Often these spots are red in males and yellow-orange in females.

Longear Sunfish *(Lepomis megalotis)*

The longear sunfish is found in clear streams and small rivers of the Mississippi River and Gulf drainages. It is brightly colored, with blue-green sides speckled with yellow and emerald. The belly is yellow to orange and the head is olive with emerald markings.

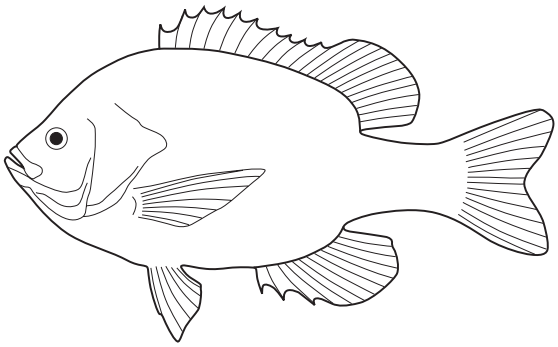


Redbreast Sunfish *(Lepomis auritus)*



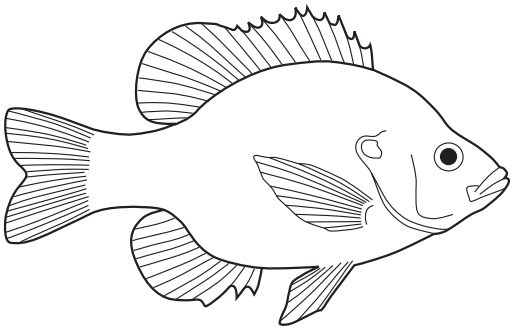
The redbreast sunfish is found in rivers and streams along the Atlantic and Gulf Coast drainages. It is olive green with an orange belly and breast. It has red spots and streaks of blue on the belly. Emerald streaks also occur on the head.

Bluegill *(Lepomis macrochirus)*



The bluegill is probably the best known and most popular species of the *Lepomis* sunfishes. It is commonly stocked with largemouth bass and is found in most all backwaters and pools of Southern streams and rivers. It is olive-green with some blue and emerald reflections on the body. The breast and belly are yellow to reddish-orange, with the males being more colorful. The sides are often marked with dark blotches on the soft dorsal fin. One subspecies, the coppernose bluegill, occurs in some areas of the South. It has a characteristic copper-colored blotch on the nose and mouth area.

Redear Sunfish (*Lepomis microlophus)*



The habitats and distribution of the redear sunfish are very similar to the bluegill. Second only to the bluegill, the redear is a well-known and popular *Lepomis* sunfish in Southern waters. It is commonly stocked in combination with bluegill and largemouth bass. The redear sunfish is olive green with a yellow-to-orange breast and belly. It often has dark vertical black markings on the sides. The **opercular lobe** (earflap) is black with a red-to-orange spot that is particularly noticeable in males. The tip is usually fringed in white.

Temperate Bass Family

White Bass *(Morone chrysops)*

White bass are native to the Mississippi River Valley. Because of their popularity, they have been stocked in many Southern reservoirs outside their native range. They typically inhabit the deeper pools of rivers and streams and the open waters of lakes and reservoirs. White bass are silver to blue-grey and have several thin and faded brown longitudinal stripes on their sides.

White bass **spawn** in early spring. Mature males migrate upstream and into tributaries as much as a month before the adult females. In the spawning area, males group together in schools. Females usually school in deeper water near the spawning area. Spawning areas have a sand or gravel bottom. Spawning occurs when a female rises toward the surface of the water. This action signals several males to approach her and **eggs** and **sperm** are released simultaneously. The eggs settle to the bottom, attach and hatch in about two days. No parental care is provided.

Striped Bass *(Morone saxatilis)*

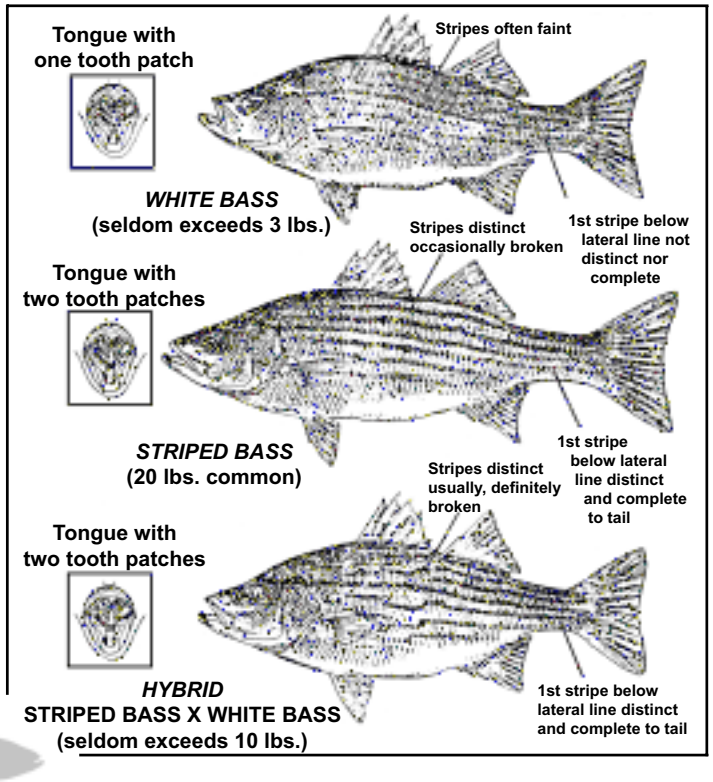
Striped bass are native to the **bays**, **estuaries** and **rivers** of the Atlantic and Gulf Coasts. Striped bass are stocked in many Southern reservoirs because of their popularity as a sport fish. They are similar in appearance to white bass except for the more prominent black-brown **longitudinal** stripes on their sides and a more slender appearance. Also, striped bass have two **parallel** teeth patches on their tongues, while white bass have only one patch.

Because striped bass live most of their life in salt water but enter the coastal streams and rivers during their spring spawning runs, they are called anadromous fish. They may travel as far as 100 miles upstream to spawn. Spawning takes place in areas with rapids and strong currents. A female is usually accompanied by a number of males. During spawning, the female and her accompanying males roll and splash at the water's surface. The semi-**buoyant** eggs are fertilized and carried downstream by the current. Eggs hatch within 75 hours.

Hybrid (White Bass X Striped Bass)

The **hybrid** white bass/striped bass does not occur naturally. However, many state and federal **hatcheries** have artificially produced this fish for stocking in public **reservoirs**. The hybrid stripes, as they are often called, have whetted the appetite of many sport fishermen and added some exciting variation to reservoir fishing. Also, because of their good taste, an aquaculture industry is developing with these fish.

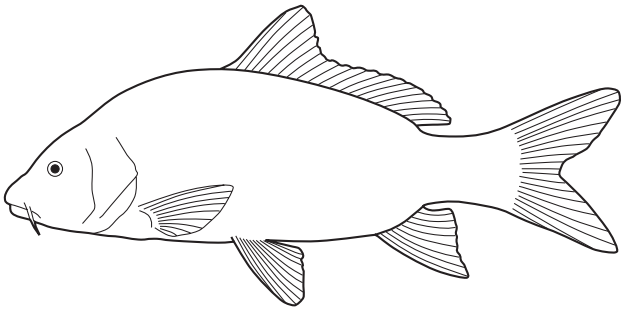
The hybrid is very similar in appearance to the striped bass. However, the hybrid has a deeper body. The best way for the angler to identify between the two is by observing the distinct lines along the side of the body. On the striped bass, these lines are seldom broken. On the hybrid, these lines are often broken and misaligned.



Minnow Family

Minnows are usually quite small, and have soft fins rather than spiny ones. Some common examples of fish in the minnow family are goldfish, shiners and an assortment of what some bait shop owners call "tuffies." However, one member of the minnow family, the carp, may grow to more than 40 pounds.

Carp *(Cyprinus carpio)*

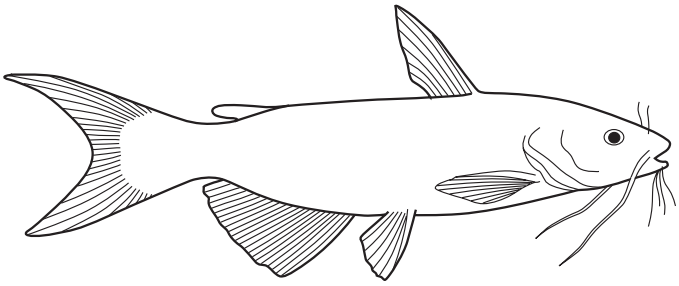


The carp is native to China. Carp are heavy-bodied fish that, unlike native Cyprinids, have a stout saw-like spine at the front of their dorsal and anal fins. They have two fleshy barbels on each side of their mouths and are typically a brassy brown color with yellow-white belly. The tail fin is often red.

Catfish Family

Catfish are primarily a fish of creeks and rivers, even though many are caught from lakes and ponds. They are soft-finned except for spines that contain a duct to tiny poison sacs that occur in the dorsal and **pectoral fins**. These spines are sharp and may inflict painful wounds if the fish are not handled carefully. Catfish also have a small fin between the dorsal and **caudal** fins called the **adipose fin.**

Channel Catfish *(Ictalurus punctatus)*

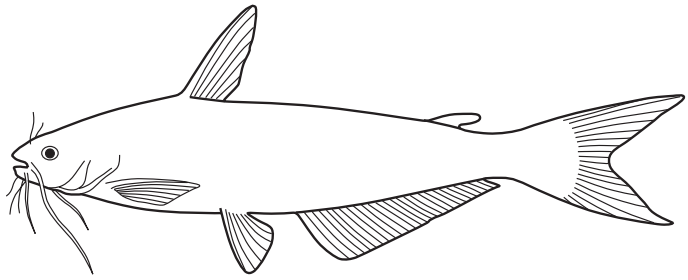


Channel catfish are one of the most popular sportfish in the South. They also are **cultured** commercially in many areas. Because of their popularity and commercial value, they have been stocked in many Southern ponds and lakes. They also are found in most of the river systems.

These fish have dark spots on their backs and sides that may not be present on very young fish or large adults. Their backs and sides are grey-blue, fading to silvery-white bellies. During spawning season, males are nearly black on their sides and back and the muscle pads on their heads are enlarged.

Channel catfish spawn in late spring or early summer. Males select and prepare the nesting sites, which are usually located in natural cavities such as hollow logs, bank undercuts and beaver or muskrat holes. During spawning, females enter the nest, spawn with the male and then leave. The male provides all the parental care. The eggs look like a mass of lumpy, yellow gelatin on the bottom of the nest. They hatch in about seven days. During this time the male hovers over the egg mass, fanning them with his fins, and occasionally compressing them with his abdomen. Besides protecting the eggs, this activity helps circulate water in and around the egg mass to keep them aerated. After hatching, the young fish remain in the nest for about another seven days until the yolk sac is absorbed. Males continue to guard the newly hatched fish until they leave the nest. The channel catfish is trimmer, more active than its relatives and possibly cleaner in its habits. Its flesh is firmer, more flaky and tastier than other catfish. As many of you may know, commercial catfish farming is big business, especially in west Tennessee. In almost every operation, the channel catfish is preferred.

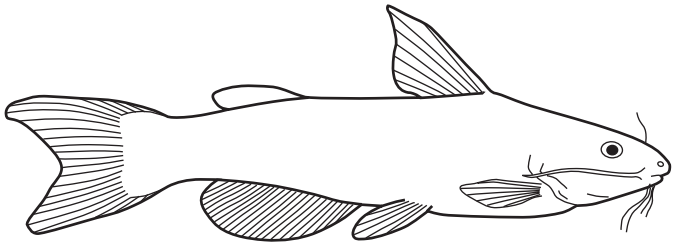
Blue Catfish *(Ictalurus furcatus)*



Blue catfish are similar in appearance to channel catfish. Unlike channel catfish, blue catfish do not have dark spots on their back and sides. Blue catfish get their common name from their coloration. They have blue-silver backs and sides that fade to silver-white on the belly.

Blue catfish are most commonly found in the large rivers and lakes of the Gulf Coast and Mississippi Valley. The commercial culture value of these fish and their popularity as a sport fish have resulted in blue catfish being actively sought by many fishermen. Their spawning habits are similar to channel catfish, except they generally spawn earlier in the year. Blue catfish are one of the larger species of catfish, commonly growing to more than 100 pounds.

White Catfish (*Ictalurus catus)*



The white catfish has been widely introduced throughout the South. This fish is blue-black, usually mottled on its back and sides, and the belly is silver. Young white catfish may resemble young channel catfish.

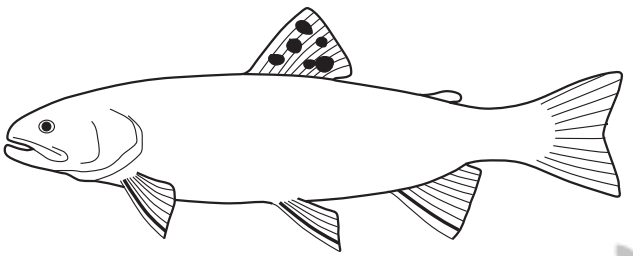
Unlike the blue and channel catfish, spawning male and female white catfish select and prepare the nest. Nests are dug into the river or pond bottom. Eggs are spawned and then covered with sand and silt.

Salmon Family

The salmon family includes several species of fish that anglers in East Tennessee love to catch and eat – trout. Trout have a very soft dorsal fin and are therefore termed soft-rayed fish. Like catfish, trout also have an **adipose** fin. They have tiny, smooth scales as opposed to the large, rough scales of spiny-rayed fish (such as the sunfish family).

Trout prefer cooler water, usually under 65 degrees F. This is the primary reason most trout in Tennessee are found in mountain streams or in the cool water that emerges behind some of our major dams.

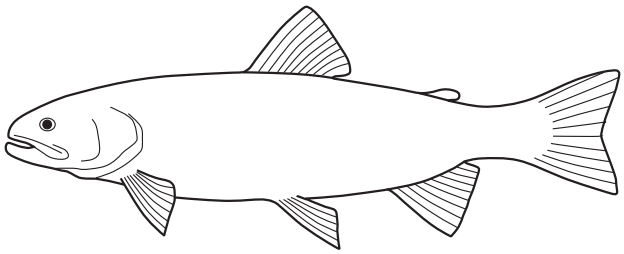
Eastern Brook Trout *(Salvelinus fontinalis)*



The brook trout is the only trout native to Tennessee. Eastern brook trout are distinguished from rainbow and brown trout by the wavy mottling on their backs and dorsal fins. Brook trout have characteristic bright red spots with blue margins on their sides. Brook trout have 210 or more scales along their **lateral line**, while rainbow and brown trout have fewer than 140 scales along their lateral lines. During the spawning season, males have red-to-orange coloration on their lower sides. Leading edges of pelvic and anal fins are white with an adjacent black stripe.

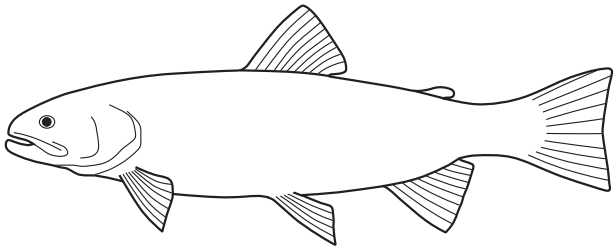
Brook trout are native to the eastern United States and Canada, but have been transplanted to many other areas.

Rainbow Trout *(Oncorhynchus mykiss)*



Rainbow trout have numerous small black-to-brown spots on the head, back, sides and tail fin. They usually have a red-orange to pinkish streak along the length of their sides. General body color is bluish or olive with silvery sides. The native range of the rainbow trout is west of the Rocky Mountains and along the Pacific Coast. They have been introduced into other areas of the country and are probably the most popular coldwater sport fish. They tolerate slightly higher water temperatures than most other trout.

Brown Trout *(Salmo trutta)*



Brown trout differ from rainbow trout by having orange-to-rusty spots on their sides and not so deeply forked tails. Brown trout do not have the red-orange to pinkish streak on their sides.

They are native to Europe and the British Isles and were first introduced into this country in 1883. Brown trout are more wary than rainbow trout,

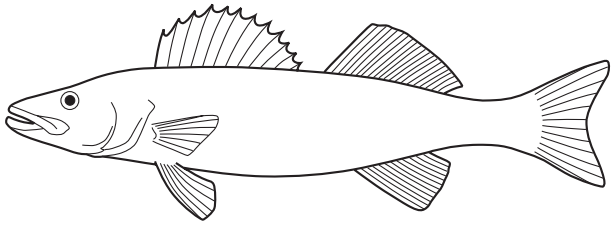
making them more difficult to catch.

The rainbow trout and the brown trout have been widely and successfully introduced into Tennessee in the past century, and they are perhaps the most common trout caught today.

Perch Family

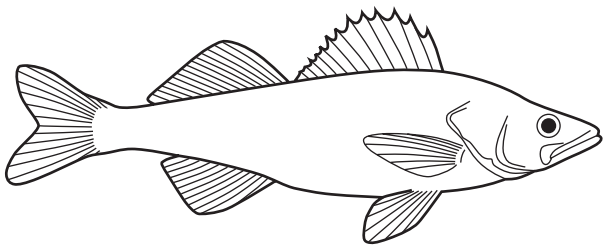
Perch are spiny-rayed fish distinguished from sunfish by their two distinct dorsal fins. Many members of the perch family, such as the darters, are very numerous in Tennessee streams and rivers, but rarely seen because they are too small to be caught with hook and line and are very shy. The two most popular sportfishes in the perch family found in Tennessee are the walleye and the sauger (sometimes called "Jack"). The yellow perch is another in this family. The walleye and sauger are similar in appearance, though the walleye has a white spot on the lower tip of the caudal fin and the sauger does not. Walleye grow to 36 inches, while sauger reach 15 inches in length.

Walleye *(Stizostedion vitreum)*



The walleye occurs in streams, rivers, lakes and reservoirs in the Ohio and Mississippi drainages. Attempts have been made to establish populations of this popular sport fish in many Southern reservoirs. The fish is yellowish to olive-brown with dark mottlings or blotches on its back and sides. The belly is white. A black blotch covers the last two membranes of the spinous dorsal fin.

Sauger *(Stizostedion canadense)*



Unlike the walleye, sauger are more often found in areas of strong current and high turbidity in streams and rivers of the Ohio and Mississippi drainages. Sauger are olive to brown with about four darker brown bars on their sides. They are very similar in appearance to walleye.

ACTIVITIES YOU CAN DO

1. Make a list of the fish you know occur in your county.

2. Pick out five of these and learn all you can about each.

a. What are their colors?

b. What do they feed on?

c. Do they make a nest and lay eggs?

d. Do they prefer warm water or cold?

e. Do they prefer running water, as a stream or river, or quiet, still water, as in a pond or lake?

f. Are they game fish protected by law?

g. Are they good to eat?

h. What kind of bait do you use to catch them?

i. Do they prefer deep water or shallow?

j. How big do they get?

k. Can humans do anything to encourage more and bigger fish in some areas?

3. Learn all you can about five fish you did not know occurred in your county.

4. Make a scrapbook of fish pictures or drawings.

5. Give a presentation on the native fish in your county at a 4-H Club meeting.

6. Fill in the parts of a fish on the diagram on the next page.

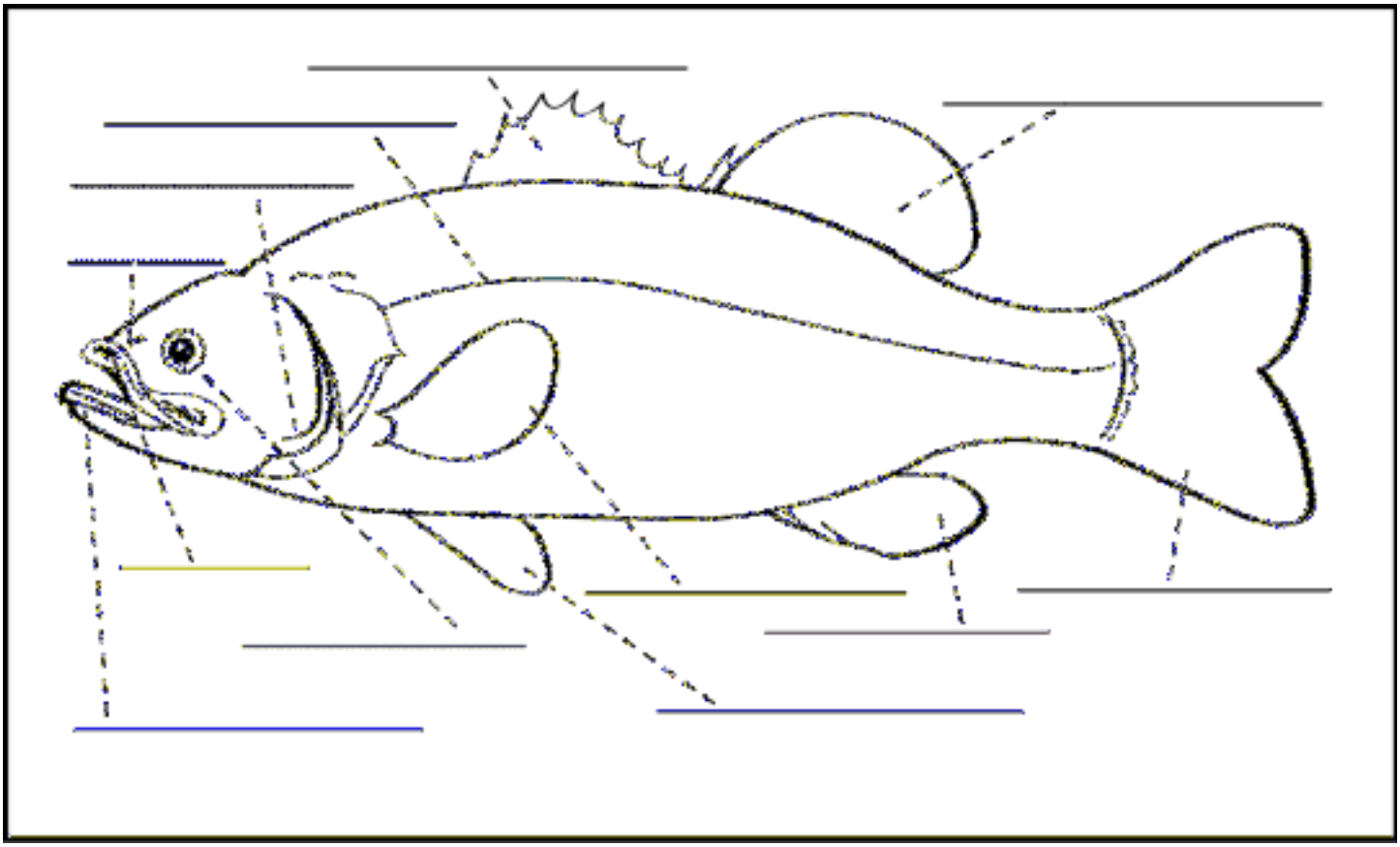
a. What fin is missing?

_____

b. In what two families of fish is this fin characteristic?

1._____

2._____



7. Go fishing with your mom or dad or another adult, or observe fish that others have caught. Fill in the following record as completely as possible.

Kind of Fish	Fish Family	Number Caught	Where Caught	Water Temperature	Bait Used

8. Make a fish display.

An attractive exhibit of common local fish will not only help you to learn about fish and fishing, but will be something that will increase the knowledge and appreciation of the public. Putting together such a display can be very instructive and lots of fun, too.

Plaster casts of common fish, or of each species caught, are worthwhile materials for exhibit. If you cannot make a plaster cast, a collection of pictures found in fishing magazines will be a good reference.

Materials needed for plaster casts:

- flat board
- paintbrush
- sand or clay
- olive oil or thin lubricating oil
- long, headless pins
- plaster of Paris
- large plastic dishpan
- bar of white laundry soap
- small jar of Vaseline®
- wire screening
- burlap or cheese cloth
- shellac

Here's What To Do

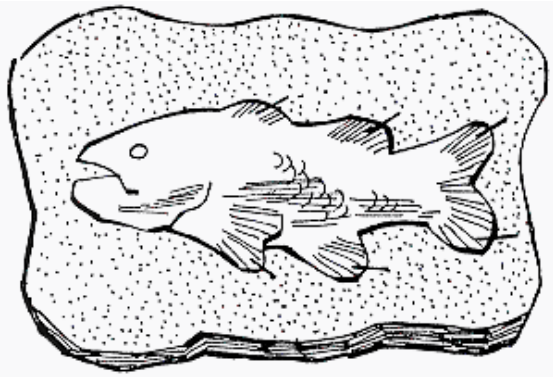
You can make your plaster casts right at the fishing area. Doing it on the scene will help you identify the fish.

Step 1

Choose a fresh fish. Remove slime and dirt by rubbing with salt. Rinse in cold water. Make a bed of sand or clay. Embed the fish in the sand or clay so that one side is covered up to the back fins and the midline of the belly.

Spread the fins and pin them to the sand or clay with long headless pins. Make sure the fin on the fish's side and the gill cover are pinned flat to the body. Brush the fish with olive oil or lubricating oil. The oil will prevent the plaster from sticking to the fish. The fin below and just in back of the head should also be pinned back against the body. Mix enough plaster of paris in your dishpan to cover the fish with a 1/2 to 1-inch layer of the plaster. (For a 5-pound fish, you will need about 10 to 15 lb. of plaster of paris.)

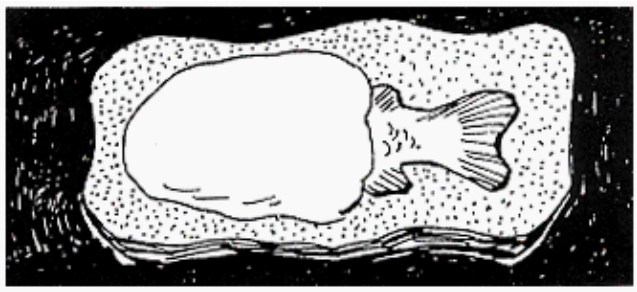
To make the **plaster of paris** batter, mix the dry plaster with enough water to make a thick cream. Add the water in small amounts, but work fast. The chemical action of plaster of paris and water is very swift and the plaster will set quickly. **Have all your materials on hand and ready before you start.**



Step 2

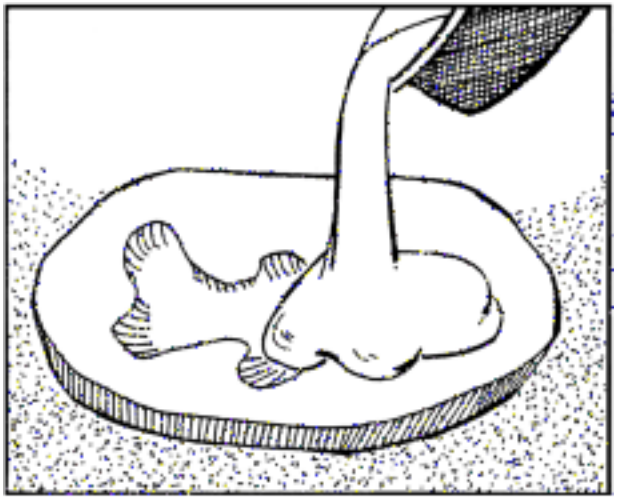
Pour plaster over the fish so that it is evenly covered all over. (A 10- to 20-inch fish requires a coating 1 inch thick.) Allow the plaster to set for 10 to 15 minutes. Wait until the casting is hard before removing. Lift the mold, turn it over and carefully remove the fish. If you have done the job well, you will have a perfect negative cast showing all the scale markings.

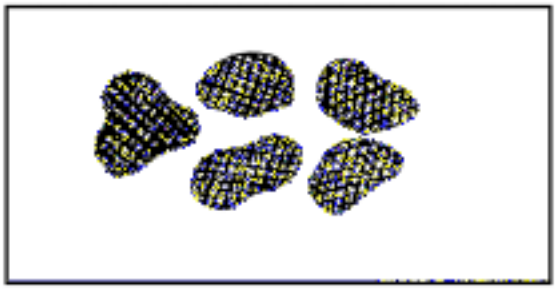
Note: Clean up your plaster dishpan – the hardened plaster is more difficult to remove from metal or enamel pans than from plastic.

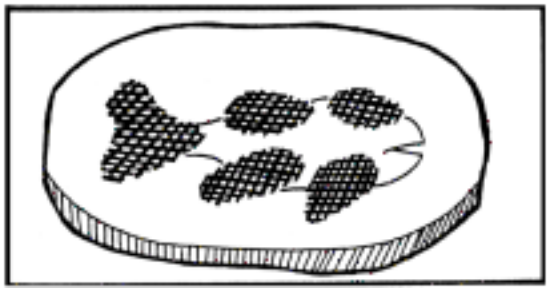


Step 3

To construct the model, soap the mold thoroughly with a soap and Vaseline® solution using a stiff paintbrush. The solution is made by shaving a quarter of a bar of white laundry soap into a cup and covering with water. Allow the mixture to sit overnight. It will then have a jellylike consistency that can be mixed with the small jar of Vaseline®.







Step 4

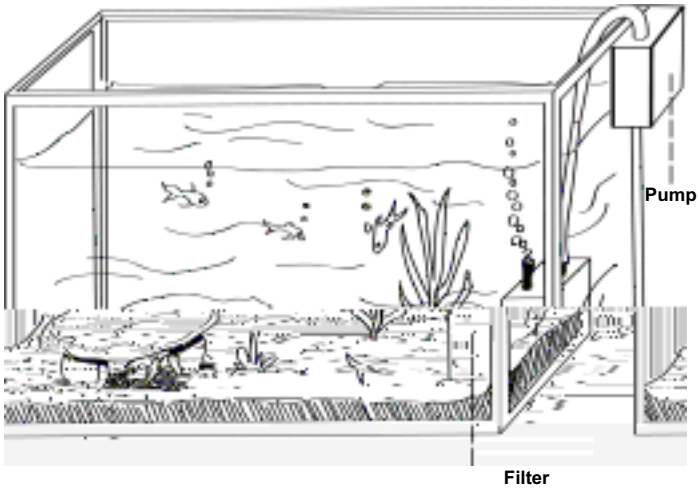
Cut the exact shapes of fins and tail from the wire screening, but add to the shapes a base that can be extended into the body portions of the fish. The screen will reinforce these delicate parts of the fish model that otherwise might easily crack off. Now cover the entire surface of the mold with at least 1/2 inch of plaster of paris. Press cut screen into the matching parts of the cast. Burlap or cheesecloth can be pressed into the soft plaster on the back of the cast to strengthen it. After two to four hours, depending upon the size of the model, remove the cast by lifting the edges slightly at several points until it is freed from the form. If it sticks, tap lightly around the edges of the plaster form until it cracks and releases the cast. To protect the model, cover it with light shellac when it is completely dry. Plaster casts can be painted if you like, for a more realistic reproduction of the fish.

Mount the casts on heavy cardboard or plywood with glue. Label each fish, identifying the species, where it was caught and the bait or lure used. Exhibit your casts at a club meeting.

9. Obtain a medium-size aquarium (5 to 10 gallons) from your school (with permission) or from a pet store. Make sure you have the proper filter and air supply to remove wastes and give fish enough oxygen to breathe. Obtain four channel catfish fingerlings (your county Extension agent will know where to get them), three of the same size (about 3 inches long) and the fourth a bit larger (about 5 inches long). Construct one simple rock shelter in the bottom of the tank, big enough for the largest fish to get under.

Observe these fish for several days. They can be fed earthworms or a commercial catfish food. Which fish stays under the shelter the most? This activity shows that the larger fish will tend to "hog" the desirable rock shelter, sometimes chasing the others away. This is a simple illustration of dominance displayed by fish.

Aquarium Setup



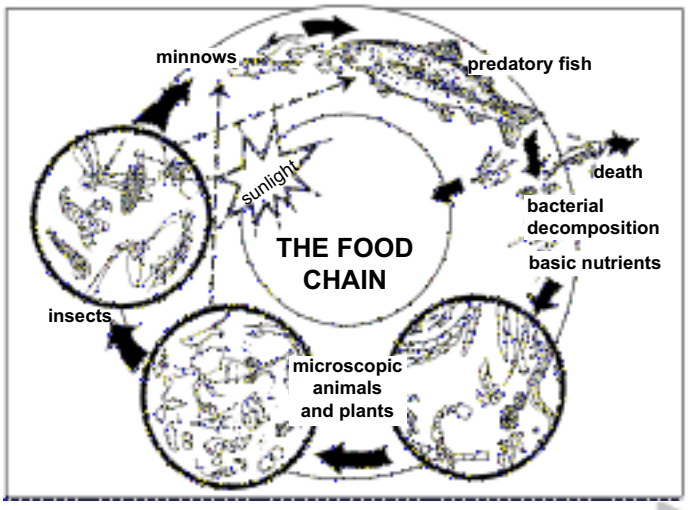
OTHER ANIMALS THAT LIVE WITH FISH

The Food Chain

Water alone is not enough to support life. There must be food available for fish to eat – so they can grow. The food supply depends on basic nutrients (organic material and minerals) dissolved in the water. These nutrients stimulate the growth of small aquatic plants and animals. These small **aquatic plants and animals** are called **plankton**. Phytoplankton is defined as the plant plankton that is able to photosynthesize material from water, carbon dioxide, using light energy. Zooplankton is the animal plankton. Through **photosynthesis**, the **microscopic plants** grow and multiply. Photosynthesis is the process by which green plants use sunlight, carbon dioxide and water to produce oxygen and store food. These microscopic plants are then eaten by microscopic animals. As the **microscopic animals** increase in number, they are fed upon by larger animals such as snails and **insects**. In turn, these are eaten by small fish**,** crayfish and salamanders. These are then consumed by larger fish, and larger fish may be fed upon by other predators, such as snapping turtles or man.

The large fish that are not captured by **reptiles**, fish-eating birds or people eventually die, sink to the bottom and **decompose**. When animals die, they become food for decomposers like bacteria, fungi and earthworms. Decomposers recycle dead fish into chemical nutrients like carbon and nitrogen that are released back into the soil, air and water.

Life in any body of water is a complex chain of plants and animals. Even though we like to catch large fish, we must remember that without the tiny plants and animals, there can be no fish.



Animals that live with fish may be an important food source to the fish, or may be equally important because they are part of the food chain. Let's examine a few of the more common groups of animals important to fish life.

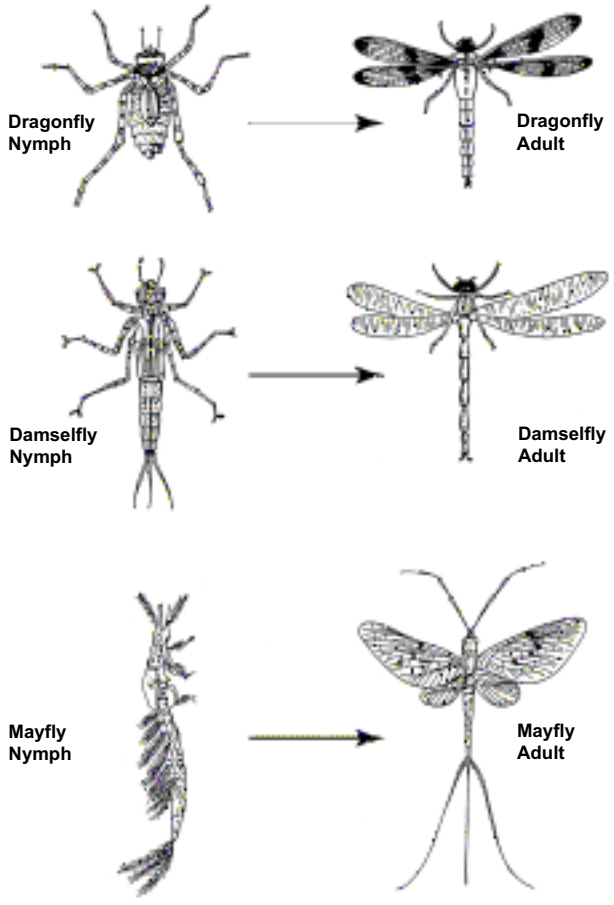
Arthropods

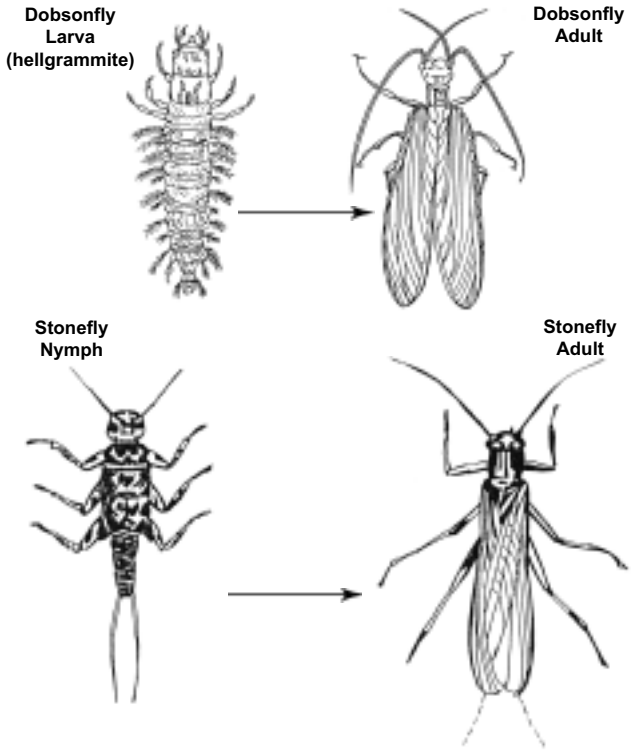
Arthropods are animals with jointed legs and hard outer skeletons. Included in this group are crayfish, spiders, and most importantly, insects.

Insects

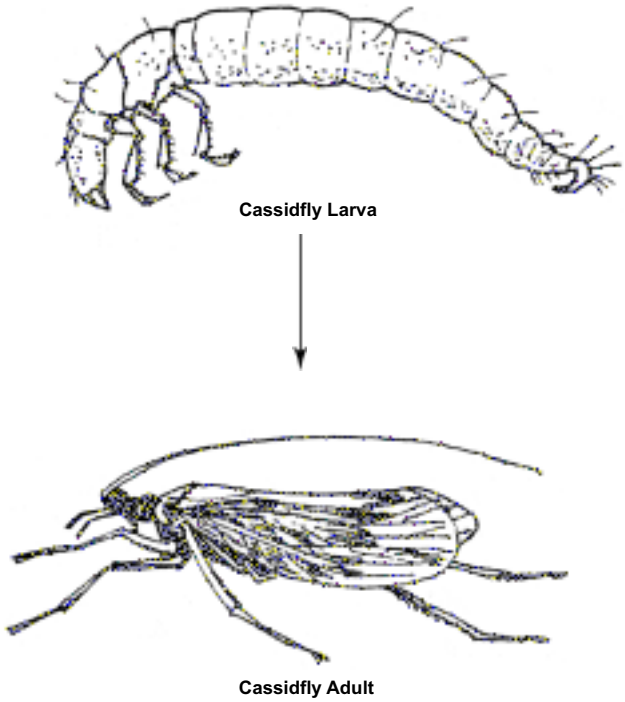
Insects are an important source of food to many birds, **amphibians** and reptiles, as well as fish. Insects are very important in the aquatic food chain.

Aquatic insects develop in one of two ways. Some insects develop from an **egg** to **larva** to **pupa** (or resting stage), and finally to an **adult**. Other insects develop in three steps: **egg** to **nymph** to **adult**. Larvae and nymphs, as well as adults, are important fish foods. The following illustrations show some insects whose immature forms live in water, with the adult living out of water.



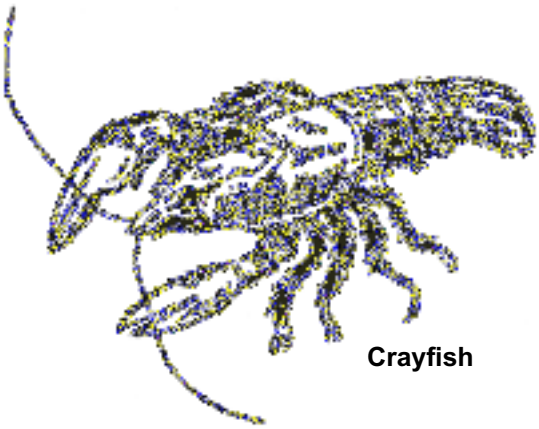


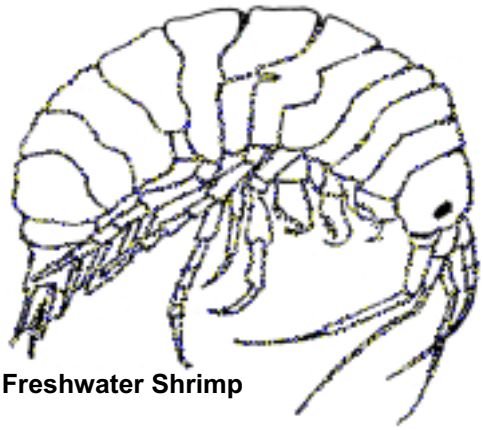
Cassidfly larvae are found in most waters in Tennessee. Many of them build a protective case from sand or plant fragments, held together by woven fibers and a sticky substance. These cases may serve as a type of camouflage to keep the larvae from being quickly eaten by fish.



Other Arthropods

Other important members of the arthropod group include crayfish and freshwater shrimp. Crayfish may eat small aquatic insects and aquatic vegetation, but most importantly act as scavengers. Freshwater shrimp are an important source of food for fish and, when present, can be found in aquatic vegetation near the shoreline.


Crayfish

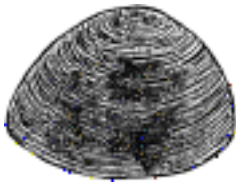

Freshwater Shrimp

Other Important Invertebrates

Snails feed mainly on algae and dead animals. There are many kinds of snails and they are an important food source for fish, as well as many mammals and birds.


Snail

Clams are found in mud and sand in shallow water. Small, thin-shelled clams are important food for fish. Animals such as turtles, minks and raccoons eat larger clams.


Clam

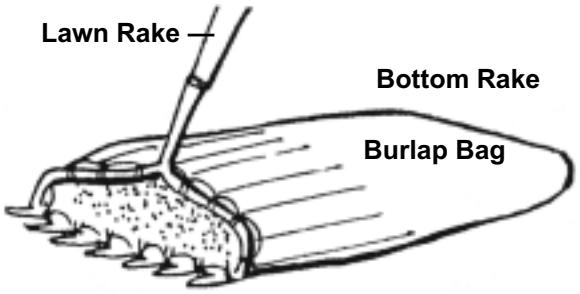
ACTIVITIES YOU CAN DO

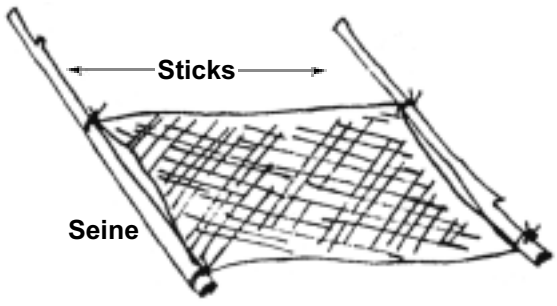
1. Go to a nearby stream and find a pool about 6 inches to a foot deep. Examine the life in this pool carefully by turning over rocks, picking up **submerged** sticks or carefully raking through dead leaves on the bottom. Record your findings in the table below.

Type of Aquatic Animal	Number Found	Stage of Development

2. Collecting insects is fun and easy. An old window screen, bordered by wood or metal, can be very useful. Stand downstream in a small creek with the screen in the water while a friend stirs up the bottom and overturns rocks. Many insects can be trapped this way. You may want to try using the screen or use a tea strainer to uncover insects hiding in pond bottom mud and debris.

   Aquatic insects may be preserved in glass bottles or kept alive in an aquarium. To preserve an insect, place it in a small glass container filled with 2/3 rubbing alcohol and 1/3 clear water. Label it with your name, the type of insect and the stages of development in each specimen, or give a talk on aquatic insect development.





Suggested Readings:

1. H.S. Zim and C. Cottam, *Insects*, a Golden Nature Guide, Golden Press, New York, 160 pp. (available from most bookstores).
2. G.K. Reid, H.S. Zim, and G.S. Fichter, *Pond Life*, a Golden Nature Guide, Golden Press, New York, 160 pp. (available from most bookstores).

FISHING AND BAITS

Fishing

Fishing is a sport that is always fun and exciting. There will always be different places for you to fish that you have not tried, different methods of fishing or a kind of fish that you have not yet caught. Fishing is one of the most popular sports in America.

Many centuries have passed since humans discovered how to catch fish on a hook and line, and thousands of books have been written on the subject. Several methods of fishing are used in Tennessee, and we will look at four of these methods now.

1. Cane Pole Fishing

The first and most basic kind of fishing is with a **cane pole** or telescopic fiberglass pole. These poles can be made or purchased at different lengths, usually from10 to 15 feet long. Along with the pole, a line of the same length or a little longer, a float, a small lead weight and a hook are all you need.

For cane pole fishing, live bait is almost always required. Most bait stores have a variety of live bait, including worms, insects and minnows. Would you like to raise your own bait? Later in this chapter, information will be discussed so you can learn to do that.

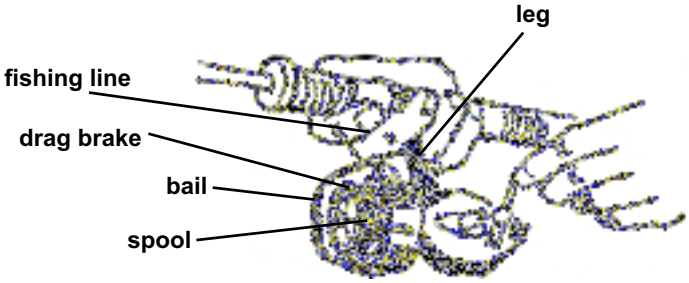
2. Spin Fishing

Spinning is a method of fishing primarily used with artificial tackle. In **spin fishing**, when a cast is made, a weighted lure, such as a spinner or topwater plug, unwinds the line from a spool that does not turn. Line is rewound on the spool as you crank the reel to retrieve the lure. With spinning tackle you can cast live bait (with the use of float and weight) or an artificial lure.

The average freshwater spinning line ranges between 4 and 8 pounds **breaking test**. There is a brake on the reel where you may adjust the slip or "drag" of the line to prevent it from snapping.

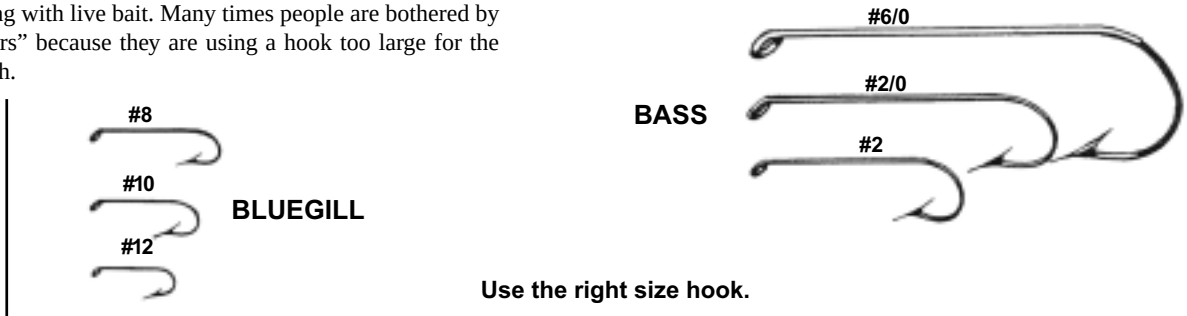
Casting Directions for a Spinning Reel

Good casting comes with being familiar with the type of equipment you are using and with practice. You can practice casting on your lawn, using a **lure** or **plug** with hooks removed. In all casting methods using an open-face spinning reel, hold the line almost against the rod with the forefinger of the right hand and trip the bail with the left hand before casting. Make a target with string on the ground and cast to it. You will find the extra practice time has been very beneficial when you get to the water and really fish.



OPEN-FACE SPINNING REEL

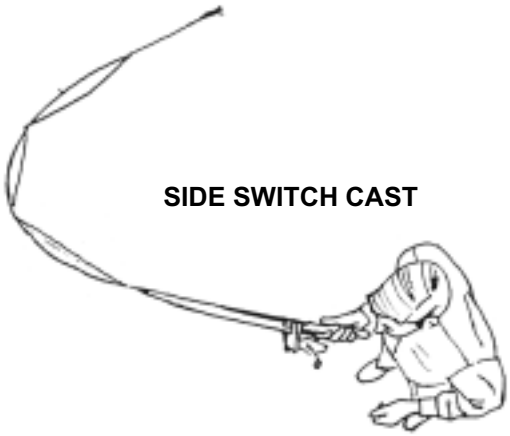
One fishing tip worth mentioning now is the size of hook to use when fishing with live bait. Many times people are bothered by "bait stealers" because they are using a hook too large for the fish's mouth.



Use the right size hook.

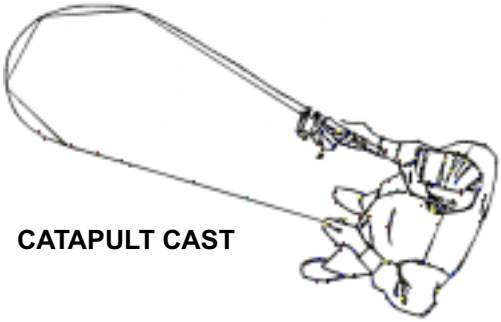
Overhead Cast. The overhead cast is probably the most popular and safest of all. When casting, imagine you are standing with your left shoulder against a large clock face. Hold the rod at 2 o'clock and aim at the spot you want the lure to hit. Bring the rod up sharply to 12 o'clock. As the lure bends the rod backward, snap the rod forward and release your forefinger from the line when the rod returns to the 2 o'clock position. The lure will sail out, pulling your line from the spool. To stop the lure, merely touch the line again with your forefinger and turn the reel crank with your left hand to bring in the lure.

Side Switch Cast. To cast a lure low over the water, simply switch the rod tip slightly downward and to the right or left a few inches and release the forefinger from the line as the rod begins to straighten. Do not swing your rod completely to the right or left, because you may hook another fisherman.



SIDE SWITCH CAST

Catapult Cast. If you are standing under overhanging bushes and wish to cast beneath low tree limbs, the catapult cast is quite effective. To make this cast, point the rod tip toward the spot that you want to hit. Holding the lure in your left hand so that you will not be hooked, pull about 3 feet of line from the rod tip. Your right forefinger is holding the line. Then pull the lure to you. This will bend the rod tip. Release the lure and – a split second later – your forefinger.

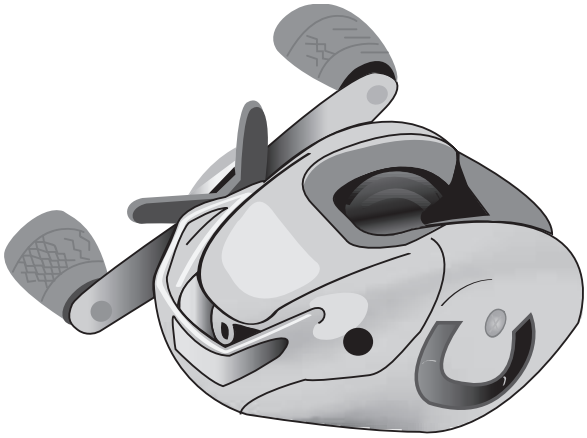


CATAPULT CAST

So far we have been talking about an open-faced spinning reel. Another kind of reel is the **spin casting reel**. It works on the same basic principle as the open-face reel, and casting directions are the same. The major difference is that the spin casting reel has a cover over the reel of line. Also, there is a button to hold the line during the backswing. Just before casting with this kind of reel, the thumb is placed on this button and held there until release is made.

3. Bait Casting

Bait casting is a method used for catching larger fish, such as largemouth bass and catfish. In bait casting, a lure or bait is cast into the water and its weight pulls the line from the reel. The bait is retrieved by rewinding the line on the reel with a moving spool. Bait-casting rods are usually stiffer than spinning rods and may use line with a 12- to 15-pound breaking test. This allows anglers to "horse" larger fish out of brush, tree stumps or fallen trees which my be submerged. Smaller lures cannot be cast as far with a bait casting reel, as opposed to a spin casting reel.

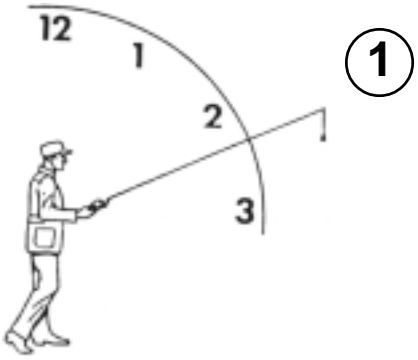


Casting Directions for Bait Casting Reel

Before beginning, make sure the reel spool is filled almost to the edges with line. A spool that is not completely full will not give the accuracy of a full spool. Remember, a casting reel and rod is held with reel on top, while the spinning reel and rod is held with the reel on the bottom.

Step 1

Hold the rod handle in your right hand with thumb on the left rim of the spool stopping the line; make sure the reel crank is up.



Step 2

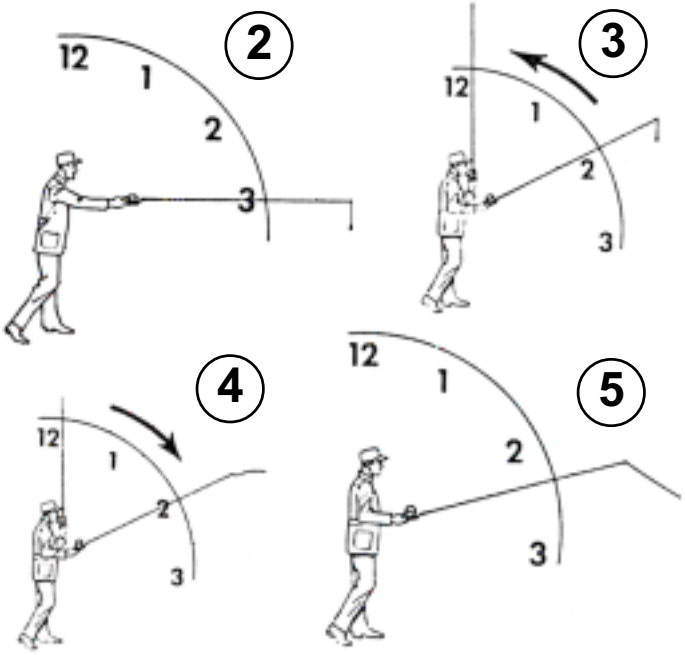
Aim the plug, which should hang 2 or 3 inches from the rod tip, toward the spot where you want the lure to land.

Step 3

Begin with the rod held at the 2 o'clock position, and then swing it quickly upward until the tip is pointed skyward at the 12 o'clock position.

Step 4

As the rod tip bends backward, reverse the movement, switching the rod quickly forward and downward. At the same moment release your thumb slightly to let the spool unwind and the lure go out. Never remove the thumb entirely from the reel spool when casting. If you do this, the spool will spin faster than the line will unwind, and you will have a tangled line or "backlash."



Step 5

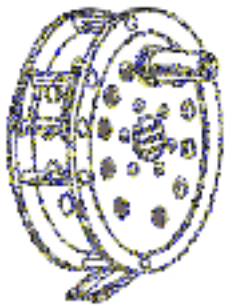
Just before the **bait** strikes the water (or ground if you are practicing at home), stop the spinning spool with your thumb, quickly change the rod handle to the left hand, and crank the plug in with your right hand.

To become a good caster, you need two things: serviceable, balanced equipment and plenty of practice!

4. Fly Casting

Fly casting is the oldest way of catching fish with mechanical tackle. In bait casting and spin casting, you cast a lure and its weight pulls the line from the reel. With a fly rod, you cast the line. The lightweight **fly** or lure simply goes with the line, attached to 6 or 8 feet of thin, transparent **monofilament**, called the **leader**, tied to the end of the fly line. Fly-casting equipment consists of five pieces: rod, reel, line, leader and lure.

The fly reel differs from the other types because it does not operate during the cast. It is just used as a convenient place to store the line. When casting, the line is pulled by hand or "stripped" from the reel. The loose line, which is quite heavy, is then cast by the fly rod to carry the almost weightless "fly" to the water. There are two types of reels available: the single-action reel is wound by hand, while the automatic reel winds the line by itself when a lever is pressed.



SINGLE-ACTION REEL

AUTOMATIC REEL

Casting Directions

Step 1

Holding the rod almost horizontal to the ground, begin pulling in, with your left hand, the line lying on the lawn or water. You are now ready to begin the cast.

Step 2

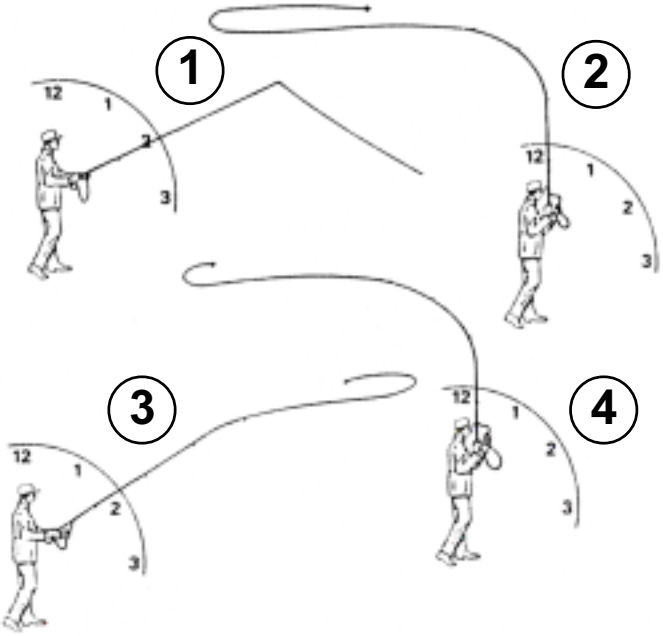
Continue pulling with your left hand until the end of the line moves. Then swing the rod upward with a brisk motion, using your wrist, until it is straight up, or at the 12 o'clock position.

Step 3

Stop the rod at this position. The line will sail over your head and behind you and will bend the rod slightly backward.

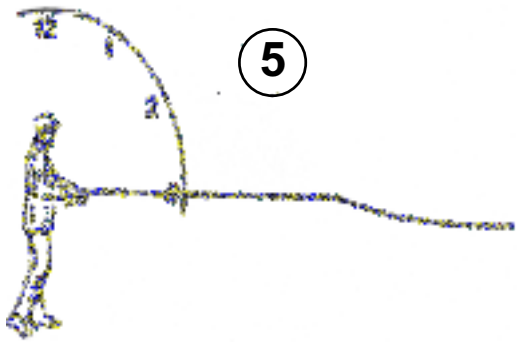
Step 4

Just before the end of the line straightens out behind you, swing the rod quickly forward and stop for a split second at the 2 o'clock position to allow the line to sail over your head.



Step 5

As the leader nears the ground, lower the rod until it is horizontal to the water or ground. This will allow the line and bug to land smoothly.



It's really not difficult, it just takes practice. As you become more skilled, you can cast greater distances by stripping off more line and holding it in long, loose loops in your left hand.

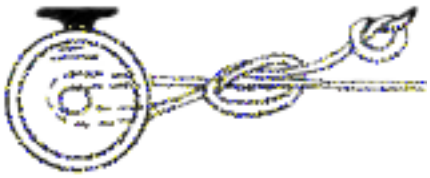
A word of caution – be sure you have lots of room when fly casting, since you have a lot of line in the air.

BASIC FISHING KNOTS

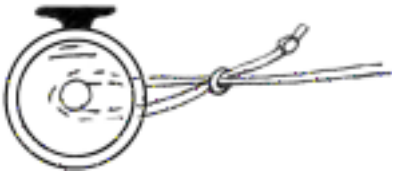
Arbor Knot

Learning how to tie an arbor knot is very simple. This knot is one of the easiest ways to attach your line around the reel spool.

1. Thread the line around the reel arbor.



2. Tie an overhand knot around the line itself. Then just tie a second overhand knot in the tag end. This second knot keeps the line from slipping through the first.



3. Grab on either side of the knots and pull tight. Cut off the excess. Then slide the first overhand knot down the line to tighten it around the reel arbor.

Albright Knot

The Albright Knot is commonly used for joining two lines of unequal diameters. It can also be used for connecting monofilament to wire.

1. Make a loop in the tag end (the short end that is being used to tie the knot, not the long end of the line) of the heavier line.

2. Run the lighter line through the loop and down around an inch of the loop's length. Twist the lighter line around the loop 8 or 9 times.

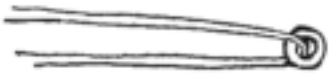
3. Run the tag end of the lighter line through the loop toward the main shaft of the lighter line.

4. Wet the knot and pull it tight.

5. Trim the excess.

King Sling Knot

This knot is primarily used to attach crank baits to the line. The King Sling Knot allows you to make a natural presentation.



1. Pull about 10 inches of the line through the eye of the lure and double the line.

2. Form a loop in the line.

3. Twist the double line three or four times.

4. Pass the lure through the loop.

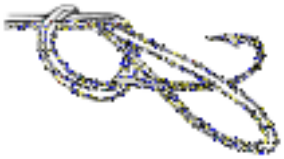
5. Pull the tag end and the main line until the knot tightens.

Palomar Knot

The palomar knot is another very quick and easy knot to tie. It works well for attaching your hook to your line.

1. Double the line over to make a loop. Then feed the loop through the eyelet of the hook.

2. Hold the standing line and form an overhand knot as shown.



3. Pass the hook through the end of the loop.

4. Then pull on the hook, the standing line and the tag end of the line to tighten the knot. Snug down tightly around the eyelet.

Double Surgeon's Loop

The double surgeon's knot is a quick, easy way to tie a loop in the end of a leader. It can also be used to form a quick loop to attach a lure or hook.

1. Double the line over to form a loop. Make a single overhand knot in the doubled-over line, making sure to not tighten the knot down yet.

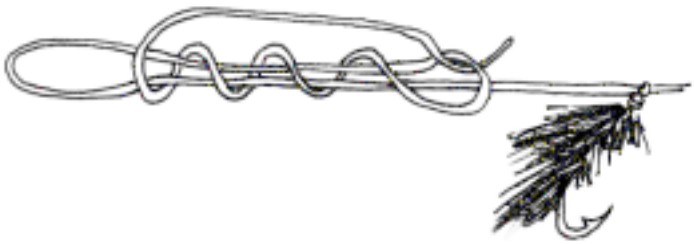
2. Then, bring the loop end around and through the overhand knot hole.

3. Holding the loop in one hand, and the tag end and standing line in the other hand, gently pull to snug the knot down.

4. Moistening the knot with water first will help to lubricate the line. Then the line will slide more easily and form a tighter knot. Trim tag end to about 1/8 inch.

Specialist Fly Knot

This knot is used to attach the fly to the leader.



1. Place the fly on the leader and slide the fly up the leader out of the way before beginning the knot.

2. Make an oval loop and hold each end while wrapping the leader around the loop center 3 or 4 times.

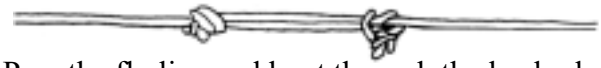
3. Place the end of the leader through the loop closest to the fly and snug the knot.

4. Trim the knot and pull snug.

Wedge Knot

This knot is also general purpose, used to join a fishing line to a leader.

1. Tie an overhand knot in the end of the fly line.



2. Pass the fly line and knot through the leader loop and back around to form a knot.

3. Pull both ends and tighten up the knot.

The Uni-Knot

The uni-knot is a general purpose knot.

1. Run the line through the eye of your hook or lure. Bring about 6 inches through the eye. Take the tag end and bend about half its length back towards the eye in a circular loop.

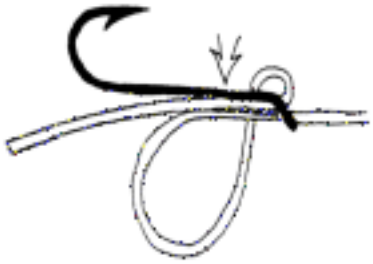
2. Twist the tag end around the double line through the circular loop about 6 times. Pull the tag end through the loop.

3. Tighten the knot up against the eye.

4. Pull the knot until it is tight. Trim the excess.

Snell Knot

The snell knot is a good knot to choose when fishing with a separate leader. It can only be used with a leader, since it uses both ends of the line to tie it.



1. Feed one end of the leader through the hook's eye, going 2-4 inches past the eye. Then feed the other end of the leader through the eye in the opposite direction. Hold the hook and leader ends between thumb and forefinger. Allow the excess leader to hang down in a large loop.

2. Holding the hook and leader in your left hand, grab this excess leader loop and the part of this loop close to the hook and wrap it over the hook shank and both ends of the leader toward the hook's barb. Go around the hook 7 or 8 times, keeping the newly made wraps contained and tight with your left thumb. Pull the short end of the leader that is through the eyelet with your right hand slowly, until the entire loop of leader feeds through it. Be sure to continue holding the 7 or 8 loops with your left hand so the knot will not unravel.

3. When it is almost tight, use your fingernails to slide it up against the eye of the hook. Finally, pull the short end of the leader and the standing line at the same time to completely tighten the knot. Trim the tag end.

ACTIVITIES YOU CAN DO

1. Give a talk and demonstration on fishing methods discussed in this chapter. Be sure when demonstrating casting to use a lure with the hooks removed!

2. Demonstrate how to tie different kinds of fishing knots. Make a display of knots on a board showing the steps involved.

3. Give a demonstration on the different kinds of fishing equipment.

4. Demonstrate how fishing gear should be cleaned and stored.

5. Demonstrate how to clean fish and prepare for eating.

NATURAL FISH FOODS

Fish get their food in water. The amount of **insects** or other food they catch on the water surface is small when compared with the food caught below the surface. The most important natural fish foods that you can raise easily are worms and crickets. With a small amount of preparation, these common fishing baits may be raised in the barn or the basement of your home throughout the year to give a constant supply of bait.

Earthworms

Worms can be reared in wooden boxes, wash tubs, steel drums cut lengthwise or other similar containers. Wooden containers 60 by 36 by 18 inches, or metal tubs 2 feet in diameter and 12 inches deep are commonly used. Containers this size will produce 3000 to 5000 worms per year. Wooden containers should be well-tarred on the outside and coated inside with hot tar or two coats of house paint.

Soil types must be considered when rearing worms. Sandy soils and heavy clays make poor rearing soils. Good **loam** or other porous soils containing organic matter are best. **Organic matter** in the form of rotted vegetation or manure may be added and mixed one part to three or four parts of soil, if needed.

Worms must be fed. The best foods consist of a mixture of one pound of 15-percent protein mash, such as complete **hog feed mash** or **broiler finisher mash**, with 1/2 pound of lard or cheap vegetable shortening. Corn meal can be substituted for mash in the mixture. This amount of food provides one feeding for the rearing containers described above.

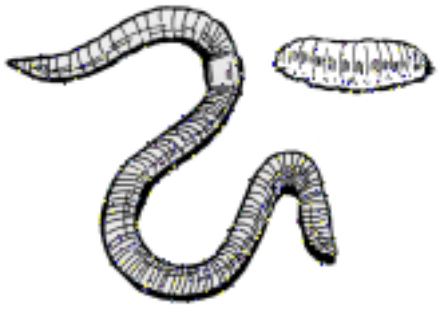
To start the rearing operation, worms may be purchased, or dug from rich soils during rainy periods. Worms also may be obtained by exploring **fertile**, well-watered grassy areas with a light at night.

To start a **culture** of worms, fill the container to a depth of 8 to 10 inches with good soil. The soil should be moistened throughout, but not saturated. Add the worm food and mix thoroughly in the top 3 inches of soil. Then add 100 worms and cover with a damp sack to prevent evaporation. Food is added at the rate of one pound for each cubic foot of soil per month. Feeding once or twice a week is enough because uneaten food will **contaminate** the bed. Wetting the soil whenever food is added usually provides enough moisture.

The rearing container should be kept in a cool, protected place. The temperature should not get higher than 70 degrees. To maintain worms at 60 to 70 degrees during cold weather, it may be necessary to cover the rearing container with a cardboard box. Heat can be provided by a light bulb inside this cover.

You should begin to find young worms in five or six weeks after "planting." The first fishing-size crop of worms will be available within six months and will continue thereafter with the proper care.

Worms will be tougher and live longer on the hook if they are scoured for a day or two prior to use. To accomplish this, place a supply of worms in a bait box containing damp sphagnum moss (from florist or greenhouse) or a piece of lace curtain for a day or two.



Crickets

Crickets are the favorite bream bait of many fishermen. The life cycle of the cricket from egg to adult takes about three months. Eggs hatch in about three weeks and the crickets are large enough for use in another month.

These insects are easily reared with a minimum of care in metal containers such as garbage cans, lard cans and metal-lined boxes. The containers should be about 2 feet deep and 15 or more inches wide. This size container produces about 200 crickets. The inside of the container should be smoothed 8 or 9 inches from the top by sandpapering and waxing or applying a thin coating of olive oil or Vaseline® to prevent escapes.

Place a layer 4 to 6 inches deep of clean, damp sand in the bottom of the container. Here is where the eggs are laid. Some people prefer sawdust instead of sand because it holds moisture better. Pieces of excelsior or straw are scattered over the surface of the sand or sawdust to provide hiding places and protection for the young crickets.

Crickets must have a continuous supply of water. This can be provided with a chick waterer, or by one or more large vials laid down in the container and plugged with cotton so that the cotton is always moist. If a chick waterer is used, the saucer should be filled with cotton to prevent the young insects from drowning.

Crickets must be fed occasionally. Chicken **laying mash** is good food for crickets. Place the food in a shallow container. About two pounds of mash are required to raise 100 crickets.

It may be necessary to provide heat in the container so the crickets will reproduce and grow well. The rearing container should be kept at about 85 degrees for the best results. This can be done by suspending a lighted bulb inside the container. A few trials with various-sized bulbs and raising and lowering the bulb will give the proper amount of heat. Production and growth of crickets may be slowed down or stopped entirely by lowering temperatures in the rearing can.

To start your colony, obtain crickets from dealers or catch them under boards, stones or decaying vegetation. About 25 adult crickets should be introduced into the can, half males and half females. The female has a very long tube on the tail end.

Fishermen usually carry crickets in a cage 9 or 10 inches square and screened on two sides. The top of the cage has a circular hole, in which a tin can (with both ends removed) is nailed in place. Crickets cannot escape from this opening and are accessible for handling.

ACTIVITIES YOU CAN DO

Date Completed:_____

_____ 1. Draw a map of a pond and the surrounding area, showing the dam, water, plant life and pond **watershed**.

_____ 2. Collect and learn the names of plants growing in or near the water.

_____ 3. Collect and preserve samples of the small animals (not fish) living in the water, such as frogs, snakes, crayfish, insects and other invertebrates.

_____ 4. Seine a pond to see if the fish population is in balance.

_____ 5. Describe how the fish population in a pond can be thrown out of balance.

_____ 6. Remove undesirable fish by draining the pond or poisoning the fish. Then restock it with desirable fish.

_____ 7. Control undesirable plant life in your pond.

_____ 8. Collect and identify turtles living in your pond and learn their feeding habits.

_____ 9. If the pond water is muddy, learn how this affects fish production and how to clear the muddy water.

_____ 10. Learn and practice fishing techniques, including the best equipment, baits and seasons. Explain the proper way to fish a pond.

_____ 11. Learn how to dress and cook fish.

_____ 12. Make an exhibit of the materials or specimens you have collected.

_____ 13. Keep good records.

Here are some goals for you when fishing in Tennessee. GOOD LUCK!!!

Tennessee Angling Records

Fish	Weight	Location	Angler	Caught
BLACK BASS FAMILY				
Largemouth Bass	14 lbs. 8 oz.	Sugar Creek	Louge Barnett	10/17/54
Smallmouth Bass (World Record)	11 lbs. 15 oz.	Dale Hollow Reservoir	D.L. Hayes	7/13/55
Spotted Bass	5 lbs. 8 oz.	Center Hill Reservoir	Gary Martin	2/4/89
Redeye Bass	1 lb. 15 oz.	Parksville Reservoir	Harry E. Parker	8/18/91
TRUE BASS FAMILY				
Striped Bass (rockfish)	65 lbs. 6 oz.	Cordell Hull Reservoir	Ralph H. Dallas	5/1/00
White Bass	5 lbs. 2 oz.	Parksville Reservoir	Hubert Parker	4/22/89
Cherokee (Hybrid)	23 lbs. 3 oz.	Stones River	Ray Pelfrey	4/17/98
Yellow Bass	2 lbs. 9 oz.	Duck River (near Waverly, TN)	John T. Chappell	2/27/98
TROUT				
Brook	3 lbs. 14 oz.	Hiwassee River	Jerry Wills	8/15/73
Brown	28 lbs. 12 oz.	Clinch River	Greg Ensor	8/30/88
Cutthroat	6 oz.	Obed River	Philip Newman	5/1/69
Rainbow	15 lbs.	Boone Reservoir	Charles Bowles	5/18/94
Ohrid	14 lbs. 5 oz.	Watauga Reservoir	Richard Lynn Carter	3/28/86
Lake	20 lbs. 1 oz.	Watauga Reservoir	Eddy Southerland	4/2/94
CRAPPIE				
Black	4 lbs. 4 oz.	Brown's Creek Lake	Clyde Freeman	3/23/85
White	5 lbs. 1 oz.	Garner Brown's Pond Dickson County	Bill Allen	4/20/68
PERCH				
Yellow	1 lb. 15 oz.	Hiwassee River	Danny Casson	12/6/92
	1 lb. 15 oz.	Melton Hill	David C. Lyons	8/25/96
Sauger	7 lbs. 6 oz.	Kentucky Reservoir (Pickwick tailwater)	Rayford D. Voss	2/19/73
Saugeye	10 lbs. 12 oz.	Melton Hill Reservoir	Chris Vittetoe	7/18/98
Walleye (World Record)	25 lbs.	Old Hickory Reservoir	Mabry Harper	8/3/60
PIKE				
Northern	24 lbs. 8 oz.	South Holston Reservoir	Frank Childers	3/28/95
Muskellunge	42 lbs. 8 oz.	Norris Reservoir	Kyle F. Edwards	4/27/83
Grass (Redfin) Pickerel	no entry			
SUNFISH				
Bluegill	3 lbs.	Farm Pond, Bledsoe County	Brad Pendergrass	12/19/87
	3 lbs.	Fall Creek Falls Creek	Thelma Grisson	6/27/77
Pumpkinseed	5 oz.	Dogwood Lake	Lynn Middleton	6/14/98
Green	1 lb. 4 oz.	North Cross Creek	Dwight M. Lehman	6/8/91
Longear	13 oz.	Pond, Overton County	Kay Forsberg	5/15/85
Redbreast	1 lb. 5 oz.	Holston River	R.W. Gillespie	6/22/74
Redear	3 lbs. 6 oz.	Private Pond	Annelise S. Houston	9/1/79
Rock Bass	2 lbs. 8 oz.	Stones River	Bill Sanford	1958
Warmouth	1 lb. 12 oz.	Nolichucky River	Frank E. Garrett	5/26/84
Flier	8 oz.	Kentucky Reservoir	Craig Ellis	6/8/01
Orangespotted	5 oz.	Nolichucky River	Donald Daryl Fox	5/30/82

Tennessee Angling Records *continued*

Fish	Weight	Location	Angler	Caught
CATFISH				
Channel	41 lbs.	Fall Creek Falls Lake	Clint Walters, Jr.	7/30/82
Flathead	85 lbs. 15 oz.	Hiwassee River	Larry Kaylor	7/25/93
Blue	112 lbs.	Lock Sea, Cumberland River	Robert E. Lewis	6/7/98
Brown Bullhead	2 lbs. 14 oz.	Chickamauga Reservoir	John Thomas Hammond	6/5/80
Black Bullhead	3 lbs. 6 oz.	Emberton's Pond, Cannon County	Hunter Chance Gaither	2/20/97
Yellow Bullhead	4 lbs. 8 oz.	Chickamauga Reservoir	Jessie R. Johnson	4/21/79
BUFFALO				
Bigmouth	52 lbs. 2 oz.	Percy Priest Reservoir	Greg Megibben	4/6/01
Smallmouth	62 lbs. 7 oz.	Percy Priest Reservoir	Jerry W. Young	4/28/01
Black	55 lbs. 8 oz.	Cherokee Reservoir	Ed H. McLain	5/3/84
GAR				
Longnose	23 lbs.	Kentucky Reservoir (Pickwick tailwater)	Jimmy Gravett	1963
Shortnose	6 lbs. 6 oz.	Kentucky Reservoir	Kay Lynn Butterfield	6/15/01
Spotted	9 lbs. 5 oz.	Cross Creeks	Victor Robinson	6/27/99
Alligator	No entry			
OTHER				
Golden Shiner	15 oz.	Chickamauga Reservoir	Dave Littlejohn	3/26/99
Skipjack Herring (World Record)	3 lbs. 12 oz.	Watts Bar Reservoir	Paul D. Goddard	2/14/82
Common Carp	42 lbs. 8 oz.	Boone Reservoir	Al Moore	8/12/56
Bighead Carp	49 lbs.	Barkley Reservoir (Cheatham tailwater)	Justin Phan	6/3/01
Israeli Carp	53 lbs.	Marrowbone Lake	John R. Pepper, Jr.	5/21/97
Freshwater Drum	54 lbs. 8 oz.	Nickajack Reservoir	Benny Hull	4/20/72
Paddlefish	75 lbs.	Center Hill Reservoir	Shane S. Henry	4/28/84
Bowfin	15 lbs. 7 oz.	Reelfoot Lake	Charles Aaron	6/22/83
River Redhorse	11 lbs.	Duck River	Cliff Crowell	4/6/93
Golden Redhorse	2 lbs. 9 oz.	Elk River	K. Daniel Boone	10/10/98
Creek Chub	3 oz.	Roane Creek	Danny Kurtilla	3/13/00
Central Stoneroller (Horneyhead)	10 oz.	Hiwassee River	Roy S. King	5/1/83
Goldeye	14 oz.	Cumberland River	Harold A. Sanders	4/17/93
Mooneye	14 oz.	Hiwassee River	Alan S. Cantrell	4/12/90
Highfin Carpsucker	1 lb. 9 oz.	Kentucky Reservoir (Pickwick tailwater)	Jim Youmans	2/28/80
White Amur	67 lbs.	Norris Reservoir	Billy Greenlee	4/13/99

GLOSSARY

Adipose fin – a small, fleshy structure with no rays or spines, situated on the midline of the back of the fish, behind the dorsal fin. Best seen on catfish species.

Adult – fully developed or mature.

Annuli – a ringlike figure, part, structure or making, such as a growth ring on the scale of a fish.

Amphibian – any of a class of cold-blooded animals (as frogs and newts) with backbones.

Aquarium – a container (as a glass tank) or an artificial pond in which living water animals or plants are kept**.**

Aquatic animals – living in water.

Bay – an inlet of a body of water, usually smaller than a gulf**.**

Bait – what the fish bite**.**

Bait casting – a type of fishing method using a bait-casting reel and rod. Usually used for catching larger fish**.**

Breaking test – a test used to identify the strength of fishing line; the amount of pounds of pressure needed to break the line.

Broiler finisher mash – a mixture of ground feed for chickens**.**

Buoyant – capable of floating.

Cane pole – an inexpensive long pole, usually cut from a stalk of bamboo, unaccompanied by a fishing reel or rod components, and used for making short-distance presentations.

Caudal – pertaining to the tail end of the body**.**

Cold-blooded – having a body temperature close to that of the environment.

Contaminated – to make impure or unfit for use by adding something harmful or unpleasant.

Cultured – produced under artificial conditions.

Decompose – to break down through chemical change.

Dissolved oxygen – oxygen that has been naturally dissolved or placed in water. Necessary for fish to live in water.

Dorsal fin – a fin on the ridge along the middle of the back of a fish.

Eggs – a reproductive body produced by an animal consisting of an ovum with its food-containing and protecting envelopes. Capable of development into a new individual.

Estuaries – a passage where the tide meets a river current; an arm of the sea at the lower end of a river**.**

Fertile – capable of growing and developing**.**

Fins – a thin appendage on the outside of an aquatic animal used to propel or guide the body**.**

Fish – a water-dwelling animal; referring to one species of fish.

Fishes – a group of different species.

Fly – a fishhook covered to look like an insect.

Fly casting – the casting of artificial flies in fly fishing.

Gill – an organ (as of a fish) for obtaining oxygen from water.

Hatchery – a place for hatching eggs**.**

Hog feed mash – a mixture of ground feed for hogs**.**

Hybrid - the offspring of genetically dissimilar parents or stock, especially the offspring produced by breeding plants or animals of different varieties, species or races.

Insect – any of a class of arthropods (as butterflies, true bugs, two-winged flies, bees and grasshoppers) with the body clearly divided into a head, thorax and abdomen, with three pairs of jointed legs, and usually one or two pairs of wings.

Larva – a young, wingless, often wormlike form (as a grub or caterpillar) that hatches from the egg of many insects**.**

Lateral line – series of pores and tubes extending along the sides of fish that helps detect disturbances in the surrounding water.

Laying mash – a mixture of ground feed for chickens that are laying eggs**.**

Leader – a short length of material for attaching the end of a fishing line to a lure or hook**.**

Loam – a soil consisting of a friable mixture of varying proportions of clay, silt and sand.

Longitudinal – placed or running lengthwise.

Lure – an artificial bait used to get the fish's attention.

Microscopic animals – small living organisms requiring a microscope to see them, such as zooplankton**.**

Microscopic plants – small living organisms requiring a microscope to see them, such as phytoplankton**.**

Monofilament – a single, untwisted, synthetic filament; fishing line.

Nymph – an immature insect that differs from the adult chiefly in the size and proportion of the body.

Organic matter – that fraction of the soil composed of anything that once lived.

Oxygen – an element that is found free as a colorless, tasteless, odorless gas. It comprises about 21 percent of the atmosphere, is capable of combining with almost any elements and is necessary for life.

Parallel – lying or moving in the same direction, but always the same distance apart.

Pectoral fin – either of a pair of fins in a fish that corresponds to the front limbs of a four-footed animal.

Photosynthesis – the process by which plants that contain chlorophyll make carbohydrates from water and from carbon dioxide in the air in the presence of light.

Plankton – small organisms living in water that drift freely with the water currents. Requires a microscope to see.

Plaster casts – imprint made in plaster of paris.

Plaster of paris – a white, powdery, slightly hydrated, calcium sulfate substance used chiefly for casts and molds in the form of a quick-setting paste with water.

Plug – a lure with several hooks.

Pupa – a form of an insect (as a bee, moth or beetle) having complete metamorphosis that occurs between the larva and the adult, is usually enclosed in a cocoon or case. Goes through change inside by which structures of the larva are replaced by those of the adult.

Reptile – any of a group of cold-blooded, air-breathing vertebrates (as snakes, lizards, turtles and alligators) that usually lay eggs and have skin covered with scales or bony plates**.**

Reservoir – an artificial lake where water is collected for water supply**.**

River – a natural stream of water larger than a brook or creek**.**

Scales – small, flattened, rigid and definitely circumscribed plates forming part of the external body covering of some species of fish.

Spawn – to produce young, especially in large numbers.

Sperm – a mobile male gamete that has a long and thin or rounded head and a long thin tail that acts as a flagellum.

Spin-casting reel – characterized by a reel with a stationary spool around which line is wound**.**

Spin fishing – a fishing method using a spin-casting reel and rod, with which artificial or live bait can be used.

Submerged – to put or go underwater.

Watershed – an area that drains into a river or lake.

Record Sheet

4-H Project Plan

Name _____ **Age**_____

Address _____

Club _____ **County** _____

Project _____ **Year** _____

Start Date _____ **Completion Date** _____

What I want to do and learn in the project (goals): _____

_____

_____

_____

How I plan to reach my goal(s): _____

_____

_____

Resources I can use (money, supplies, equipment, help from others, etc.): _____

_____

_____

_____

Signed:_____ Signed:_____

4-H Member Parent/Guardian

(This form should be included in the Project Record Section
of the **4-H Achievement Record Book**.)

Record Sheet

Project Plan Evaluation

Project _____ **Year** _____

Start Date _____ **Completion Date** _____

What I did: _____

_____

_____

_____

I feel that I met my goals (or did not meet my goals) because: _____

_____

_____

_____

Resources I used (money, supplies, equipment, help from others, etc.): _____

_____

_____

_____

Other things I would like to do: _____

_____

_____

_____

Signed:_____ Signed:_____

4-H Member Parent/Guardian

(This form should be included in the Project Record Section
of the **4-H A cord Book**.)

The Symbols of 4-H Work

As 4-H work has grown through the years, symbols that express the spirit of 4-H work have been developed. Every member and leader should be thoroughly familiar with them.

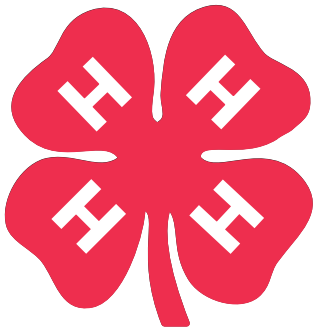
The 4-H's

The 4-H's stand for HEAD, HEART, HANDS and HEALTH. They represent the fourfold training and development that 4-H members undergo.

4-H Pledge

All 4-H members and leaders should know and be able to repeat the 4-H Pledge:

I pledge -
My Head to clearer thinking
My Heart to greater loyalty
My Hands to larger service
And my Health to better living
For my Club, my community,
my country and my world.



In repeating the pledge, stand at attention, raise the right hand to the side of head when speaking line one; lower right hand over heart when speaking line two; extend hands, palms upward, when speaking line three; drop hands to side, and stand at attention when speaking line four.

4-H Motto

The 4-H motto, "To make the best better," should be the aim of every 4-H member and leader.

4-H Emblem

The National 4-H emblem is a four-leaf clover with the letter "H" on each leaf. The H's stand for Head, Heart, Hands and Health. The four-leaf clover signifies "Good Luck."

4-H colors - Green and White

White symbolizes purity and high ideals. Green is nature's most common color and is emblematic of springtime, life and youth.

Visit the UT Agricultural Extension Service Web site at http://www.utextension.utk.edu/ and the 4-H Club Web site at http://www.utextension.utk.edu/4-H/

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