

# MERIT BADGE SERIES



# FLY-FISHING



BOY SCOUTS OF AMERICA®



## HOW TO USE THIS PAMPHLET

The secret to successfully earning a merit badge is for you to use both the pamphlet and the suggestions of your counselor.

Your counselor can be as important to you as a coach is to an athlete. Use all of the resources your counselor can make available to you. This may be the best chance you will have to learn about this particular subject. Make it count.

If you or your counselor feels that any information in this pamphlet is incorrect, please let us know. Please state your source of information.

Merit badge pamphlets are reprinted annually and requirements updated regularly. Your suggestions for improvement are welcome.

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## WHO PAYS FOR THIS PAMPHLET?

This merit badge pamphlet is one in a series of more than 100 covering all kinds of hobby and career subjects. It is made available for you to buy as a service of the national and local councils, Boy Scouts of America. The costs of the development, writing, and editing of the merit badge pamphlets are paid for by the Boy Scouts of America in order to bring you the best book at a reasonable price.



BOY SCOUTS OF AMERICA  
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# FLY-FISHING



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# Requirements

1. Do the following:
  - a. Discuss the prevention of and treatment for health concerns that could occur while fly-fishing, including cuts and scratches, puncture wounds, insect bites, hypothermia, dehydration, heat exhaustion, heatstroke, and sunburn.
  - b. Explain how to remove a hook that has lodged in your arm.
  - c. Name and explain five safety practices you should always follow while fly-fishing.
2. Demonstrate how to match a fly rod, line, and leader to achieve a balanced system. Discuss several types of fly lines, and explain how and when each would be used. Review with your counselor how to care for this equipment.
3. Demonstrate how to tie proper knots to prepare a fly rod for fishing:
  - a. Tie a backing to a fly reel spool using the arbor knot.
  - b. Attach backing to fly line using the nail knot.
  - c. Attach a leader to fly line using the needle knot, nail knot, or a loop-to-loop connection.
  - d. Add a tippet to a leader using a loop-to-loop connection or blood knot.
  - e. Tie a fly onto the terminal end of the leader using the improved clinch knot.

4. Explain how and when each of the following types of flies is used: dry flies, wet flies, nymphs, streamers, bass bugs, poppers, and saltwater flies. Tell what each one imitates. Tie at least two types of the flies mentioned in this requirement.
5. Demonstrate the ability to cast a fly 30 feet consistently and accurately using both overhead and roll cast techniques.
6. Go to a suitable fishing location and observe what fish may be eating both above and beneath the water's surface. Explain the importance of matching the hatch.
7. Do the following:
  - a. Explain the importance of practicing Leave No Trace techniques. Discuss the positive effects of Leave No Trace on fly-fishing resources.
  - b. Discuss the meaning and importance of catch and release. Describe how to properly release a fish safely to the water.
8. Obtain and review a copy of the regulations affecting game fishing where you live or where you plan to fish. Explain why they were adopted and what is accomplished by following them.
9. Discuss what good outdoor sportsmanlike behavior is and how it relates to anglers. Tell how the Outdoor Code of the Boy Scouts of America relates to a fishing enthusiast, including the aspects of littering, trespassing, courteous behavior, and obeying fishing regulations.
10. Catch at least one fish and identify it. If local fishing and health regulations allow, clean and cook a fish you have caught. Otherwise, acquire a fish and cook it.



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# Introduction

Fly-fishing is a specialized form of fishing that emerged centuries ago, as far back as 1653, when Sir Izaak Walton wrote *The Compleat Angler*, and perhaps to the time of the Roman empire. Long before there was spin fishing or bait casting, there was fly-fishing. Because it combines skill and artistry and because it is so rich with tradition, fly-fishing is a passion for millions of people. The beauty of the water, the solitude, and the skills that the sport requires have made fly-fishing very important in the lives of many notable people, including former President Jimmy Carter, who wrote books about fly-fishing after he left office. Another avid fly fisherman was Lord Baden-Powell, a former general in the British Army, who wanted to use his military fame to help boys become better men and eventually started the worldwide movement that we know today as Scouting.

In a biography of Baden-Powell, we find the following description by a fellow angler:

“I should say B-P was as good an angler as he was at most things. He preferred river fishing for sea trout or salmon, and liked to be on his own, particularly on any river requiring more than the usual care and courage. I think his chief joy in fishing was that it took him away from the ordinary business of life more effectively than anything else, particularly when the formalities too often connected with sport were bypassed. He was always entranced with the beauty of river life, especially in the autumn, with its gorgeous colouring.

“Even the Boy Scouts had to give place to science and philosophy when the day’s work was finished on the river. I don’t think he was ever so supremely happy as he was when wading deep and waiting for that electrical thrill of taking a fish.”

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Some experts believe fly-fishing may date back to the time of the Roman empire.

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In his book, *Scouting for Boys*, Baden-Powell included a small chapter titled “Fishes and Fishing.” His advice in this passage is still sound:

“Every Scout ought to be able to fish in order to get food for himself. A tenderfoot (beginner) who starved on the bank of a river full of fish would look very silly, yet it might happen to one who had never learned to catch fish.

“Fishing brings out a lot of the points in Scouting, especially if you fish with the fly. To be successful you must know about the habits and the ways of the fish, what kind of haunt he frequents, in what kind of

weather he feeds and at what time of the day, and so on. Without knowing these, you can fish away until you are blue in the face and never catch one.

“A fish generally has his own particular haunt (position) in the stream, and once you discover a fish at home you can go and creep near and watch what he does.

“And you have to have infinite patience. Your line gets caught up in bushes and reeds, or in your clothes—or when it can’t find any other body it ties up in a knot around itself. Well, it’s no use getting angry with it. There are only two things to do—the first is to grin, and the second is to set to work very leisurely to undo it. Then you will have loads of disappointments in losing fish through the line breaking, or other mishaps. But remember they happen to everybody who begins fishing, and it is the troubles that in the end make it so very enjoyable when you get them.

“When you catch your fish do as I do—only keep those you specially want for food or specimens, put back the others the moment you have landed them. The prick of the hook in their leathery mouth does not hurt them for long, and they swim off quite happily to enjoy life in their water again.”



**Fly fisherman, circa 1884**

Baden-Powell was both entirely sensible and far ahead of his time in this advice. Today, all fishermen practice a conservation ethic. Fly fishermen pioneered the idea of *catch and release* fishing and generally put most of the fish they catch back in the stream to live—and perhaps be caught again—another day.

In Baden-Powell's time, fly fishermen were out to catch either trout or salmon. Today, fly fishermen go after all kinds of fish in all kinds of environments, including salt water. Fly-fishing is demanding and requires practice, skill, and knowledge. But it is also a form of recreation through which an angler finds himself in beautiful surroundings, observing the natural world and becoming a participant in it. Learning to be an expert fly fisherman pays off in a lifetime of the deepest kinds of satisfaction and enjoyment.



# The Basic Equipment

Early fly fishermen practiced their craft with rudimentary and basic equipment—a line tied to the tip of a long, thin rod. As their expertise developed, their fishing equipment did, too. They devised a system of guides, tied in a row, so that loose line could be released at the cast, allowing the fly to sail out much farther. Later, a reel was devised, fastened to the lower, butt end of the rod, as a place to store the extra line.

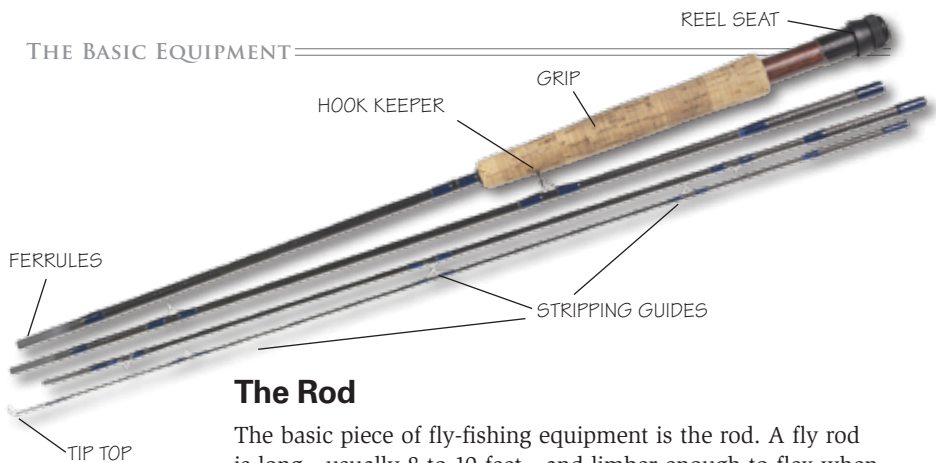
Today's fly rods are limber and light, weighing only a few ounces, and they provide the maximum amount of leeway to a fighting fish. The lines are tapered, as are the leaders, to add to the unfurling effect of the cast.

## A Balanced Outfit

When the rod, reel, and line are correctly matched to handle a given-weight fly line, they are considered to be in **balance**. When in proper balance, they allow the angler to deliver a fly with accuracy within desired distance. Modern tackle manufacturers continually test and upgrade their rods, reels, and lines to create better balance for line control and easier casting.

Fly-fishing requires a match between the rod and line, with the reel mainly functioning as line storage, although its weight can determine how easily casts can be made. Fly rods usually are marked with numbers indicating which line works best on a particular model.





## The Rod

The basic piece of fly-fishing equipment is the rod. A fly rod is long—usually 8 to 10 feet—and limber enough to flex when casting a line or playing a fish. Most modern fly rods are made from a material called **graphite**, although a few manufacturers and some artisans still make rods from the traditional bamboo. Bamboo rods tend to cost hundreds of dollars and do not perform any better than those made of graphite.

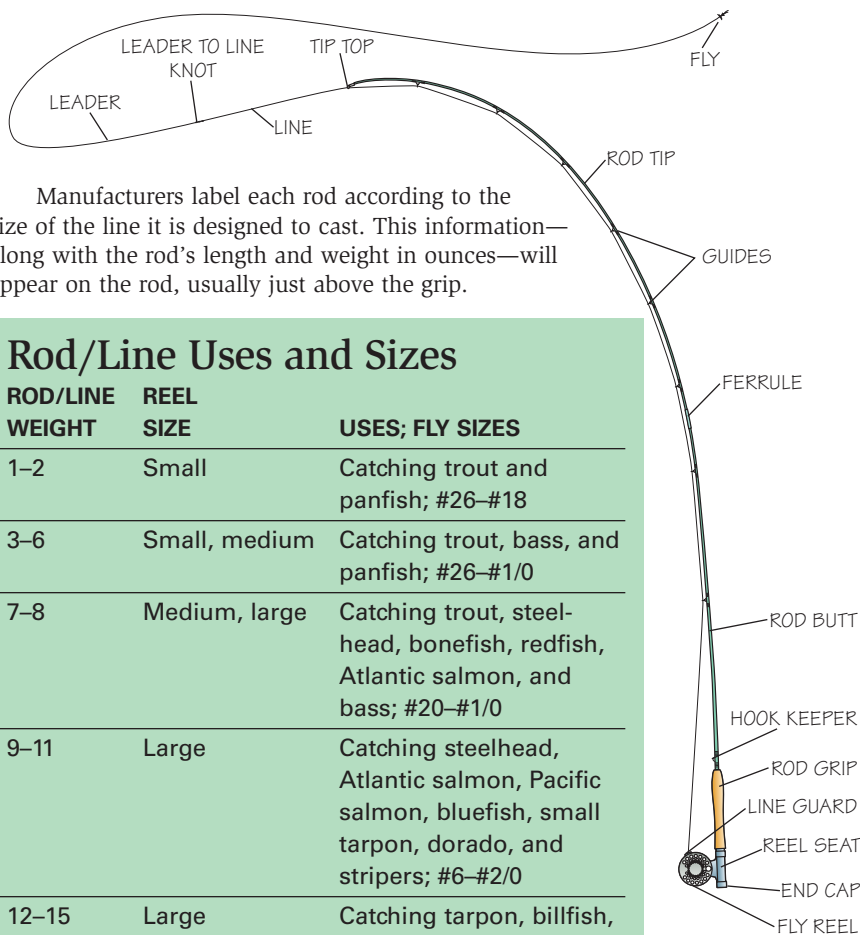
Fly rods are tapered with a cork grip and a reel seat at the thick end. Near the grip, you will find a small wire loop, called a hook-keeper, that holds the hook of a fly safely when it is not in use.

Spaced along the length of the rod are several **guides**, designed to run the line to the rod tip. The first guide, usually made from some abrasion-resistant material, is called the **stripping guide**. Above this guide, there will be snake guides, which are normally simple wire loops. The last guide, at the tip of the rod, is called the **tip top**.

For convenience while traveling, most rods are designed to be broken down into at least two—and sometimes as many as 10—sections. The joints where the rod comes together are called **ferrules**.

## Selecting a Rod and Line

A fly rod is a long lever that flexes. As it flexes more deeply, it delivers longer casts. Every fly rod is designed to be matched to a line of specific weight. Lines of lighter weight are matched to more delicate rods. Anglers use these, in general, to deliver tiny artificial lures (flies) to where they believe a fish may be lurking. The rod and the line must match because the weight of the line is what causes the rod to flex and turn the line over in a smooth, efficient cast.



Manufacturers label each rod according to the size of the line it is designed to cast. This information—along with the rod's length and weight in ounces—will appear on the rod, usually just above the grip.

## Rod/Line Uses and Sizes

ROD/LINE WEIGHT	REEL SIZE	USES; FLY SIZES
1–2	Small	Catching trout and panfish; #26–#18
3–6	Small, medium	Catching trout, bass, and panfish; #26–#1/0
7–8	Medium, large	Catching trout, steelhead, bonefish, redbfish, Atlantic salmon, and bass; #20–#1/0
9–11	Large	Catching steelhead, Atlantic salmon, Pacific salmon, bluefish, small tarpon, dorado, and stripers; #6–#2/0
12–15	Large	Catching tarpon, billfish, and tuna; #2/0–#8/0

## Rod Length

Fly rods can be as short as 6 feet and as long as 15 feet or more. Many anglers use one-handed rods between 7½ and 9½ feet in length. Shorter rods are desirable on close brushy streams. Longer rods enable the angler to make higher back casts and to keep the line and the fly above obstructions such as grass and brush. Rods longer than 10 feet are generally used by anglers who employ a specialized two-handed casting technique, called spey casting, that is popular on some salmon and steelhead rivers.

## Lines

Most fly lines are 80 or 90 feet long. Lines vary by weight, and must be matched to the rod. They come in different styles (called **tapers**) and colors and are designed either to float on the surface of the water or to sink to different depths at different rates. Intermediate lines, for example, sink very slowly and can be fished just below the surface. Heavily weighted lines sink quite rapidly and are designed to get down deep very quickly.

Most fly-fishing is done with floating lines, which are the easiest to cast and control. But there are times and conditions when fish lie deeply in the water and are not feeding at or near the surface. A sinking line is then useful to get the fly down to them.

Fly lines come in different colors. Sinking lines usually come in drab, darker colors so that the fish cannot spot them. Floating lines can be very brightly colored, even fluorescent. Many anglers prefer these lines for their high visibility. In low light conditions, a darker line can be hard to see on the water. A visible fly line can be the best means of keeping track of the location of small flies on the water.

Fly lines are constructed of a soft, strong core with a tough, enamel-like coating. Avoid situations that might cause nicks or small cuts in the fly line, taking special care not to step on the line. Heat and sunlight are the greatest threats to a fly line, so do not store a reel with a line on it in a hot place or leave it in a car trunk for long periods of time. A properly maintained fly line should last several years.

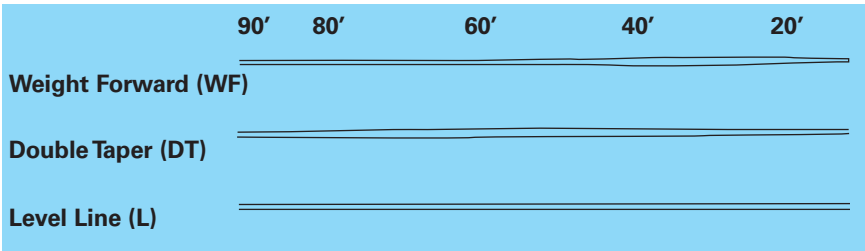
If your fly line becomes dirty, it will not function well. Be especially careful when using insect repellents. Some will damage the coating of the fly line. Clean your line occasionally with mild soap and water.

## Tapers

Fly lines of all weights are designed in different **tapers**, which describe the shape of the line. The narrow point of the line allows for delicate presentations. A line that is of the same diameter throughout its length is called “level.” Level line is inexpensive but is not recommended for casting.

A line that has its widest diameter at the midpoint is called a double taper. This is a popular line for some kinds of fishing, especially those requiring shorter casts. Because the fly





### The basic fly-line tapers and their relative dimensions

line is 90 feet long and the angler seldom uses more than half of that to cast, when one end of the line becomes nicked or frayed, it can be reversed to make use of the other end.

A **weight-forward taper** line bulges to its widest diameter about 20 feet from the end of the line. This puts the weight up front and makes the rod flex efficiently without casting an especially long line. The line behind the bulge is narrow in diameter. The heavy forward line is designed to pull or “shoot” the lighter line following it.

## Decoding a Fly Line

When you buy a fly line, the information about that line is marked on the packaging in a kind of code. For instance, you might see the following: **WF5F**. The first two letters of the code tell you the taper of the line. In this case, it is a *weight-forward taper*. Other designations include **DT** (double taper) and **L** (level). The number that follows the taper designation is the weight of the line. In this case, the line is a number 5.

The letters that follow the number indicating the weight of the line tell you whether the line floats or sinks. In this case, the **F** indicates that this is a floating line. Other designations could be **S** (sinking), **F/S** (sink tip), **I** (intermediate), **HD** (high density or fast sinking).



## Fly Reels

A fly reel stores line and puts tension on the line when a fish makes a long run and is pulling line off the reel. A fly reel is an essential piece of equipment in fly-fishing, but it is not as specialized as the rod or the line.

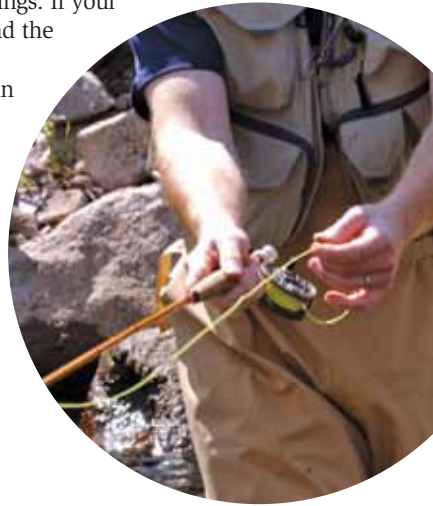


On smaller reels, such as those used for panfish and small trout, line storage is the reel's chief function. A bluegill weighing less than half a pound is unlikely to take off on a long run and strip yards of line from the reel. As the fish get larger, however, this function of a reel becomes more important.

The mechanism for providing resistance when a fish is taking line is called **drag**. The drag system on a small reel—like the one used for panfish—will be a ratchet and pawl. Anglers call this the **clicker**. Larger reels, for saltwater fish or for salmon and steelhead in freshwater, use a disc drag with cork or Teflon pads. Both drag systems are adjustable by means of a knob on the outside of the reel that allows the angler to increase or decrease tension.

When selecting a reel, choose one that is the right general size for the kind of fishing you plan to do. It should have the capacity to hold the selected line and some backing (the line that goes on the reel before the fly line). Manufacturers will indicate a reel's line capacity somewhere on the packaging. For instance, the manufacturer might state that a reel is designed for a WF5F line with 100 yards of backing. This means you could use a little heavier line with a little less backing or a lighter line with more backing. Also, if you plan to fish in salt water, make sure that the reel you choose is designed for this kind of use. It should be made of corrosion-resistant material such as anodized aluminum for the frame and stainless steel for the inner workings. If your reel is not corrosion resistant, be sure to wash it and the line in freshwater to clean away the salt.

Next, decide which hand you will use to reel in line. Some anglers prefer to cast and reel with the same hand—which means they have to switch rod hands when they are playing a fish or retrieving loose line—while others cast with one hand and reel with the other. Most reels are designed for right-hand retrieve. Most smaller reels can be changed over to left-handed retrieve in a few simple steps to change the click mechanism, involving nothing more than a screwdriver. Larger reels generally require more elaborate work that will have to be done at the factory or by an expert.



## Backing

**Backing** is the line that goes on the reel before the fly line. It is generally made of polyester fiber of a fine diameter. It costs less than coated fly line. In the case of larger reels for bigger fish, there may be as much as 300 yards of backing.

There are two reasons for using backing. The first is that some big fish will run much farther than the length of the fly line. Fly fishermen love to talk about how a fish “took me into the backing.” A big tarpon, in salt water, might run out 200 yards of backing before the pressure from the reel's drag and the rod's deep bend stop him. The second reason for backing is that the reel spool is generally of fairly small diameter and fly line tends to hold a coiled shape when it comes off the reel. The closer to the spool, the tighter the coils and the harder they are to pull out of the line. With backing on a reel, the fly line comes off in wider coils that are easier to manage.

You can make your own tapered leader by tying lengths of monofilament of different diameters together. Also, manufacturers have developed knotless leaders that are tapered throughout their length by an extrusion process.

## Leaders

The **leader** is a transparent plastic line tied between the end of the fly line and the fly. It is often tapered to a very fine point to which the fly is tied. Leaders are supple, so they do not hinder the natural action of a fly. They are transparent so that they are hard for a fish to see. Usually they are 6 to 12 feet in length. In general, clearer water demands longer leaders. Smaller flies call for finer leaders.

## Avoiding Leader Problems

It is possible that more hooked fish are lost because of leader problems than for any other reason. And more fish are never hooked in the first place because the fisherman was using the wrong leader, one that made it impossible to cast properly or one that did not allow the fly to behave like a natural prey.

Leaders become damaged during a day of fishing. They pick up nicks from rocks or branches. Sometimes they become knotted when the angler makes a poor cast and throws what is called a **tailing loop**. These **wind knots** can decrease the breaking strength of a leader by as much as 50 percent. Leaders should be inspected for such knots and damage. If you find a knot, take it out of the leader. If the leader looks frayed, repair the damaged section of the leader and tie on new tippet material or replace the entire leader.

## Tippets

The **tippet** is the most delicate link between the fisherman and the fly. Choose a tippet fine enough to allow the fly to move naturally and strong enough to hold a fish. Tippets can be as small as .003 inches in diameter, that is, as fine as a human hair. The breaking point of such a small tippet is less than a pound. Tippets are measured by diameter. A heavy tippet is a 0X. Very fine is 8X.

While tippet size and strength may vary among manufacturers, this chart describes tippet diameter, pound test of breaking strength, and the appropriate fly size to use.

Tippet Size	Diameter	Fly Size	Pound Test
0X	.011"	#2-#4	14
1X	.010"	#4-#8	12
2X	.009"	#6-#10	10
3X	.008"	#8-#12	8
4X	.007"	#10-#14	6
5X	.006"	#12-#16	4
6X	.005"	#14-#22	3
7X	.004"	#18-#24	2
8X	.003"	#22-#28	1

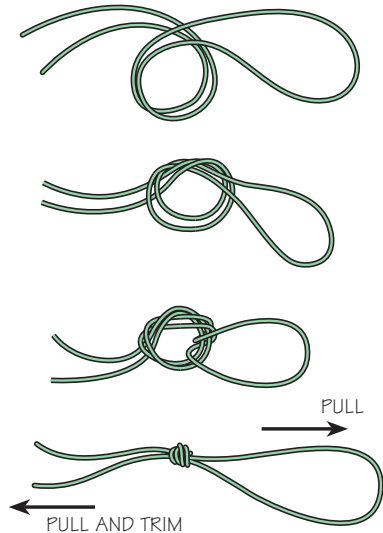
Tippet size and length is critical. A tippet that is too fine for the fly that is being fished will collapse at the end of the cast instead of unfurl. A tippet that is not fine enough will cause the fly to behave unnaturally. A leader that is too short will cause the fly line to land too close to fish and possibly alarm them. A leader that is too long may be difficult to control, especially under windy conditions on brushy streams. A leader of around 9 feet is about average, but it can be lengthened or shortened as conditions require.

With a proper cast this leader would efficiently transmit the flow of energy all the way down to the tippet, which would straighten out and allow the fly to fall gently on the water.

A tippet can be added to a leader with a double surgeon's loop or a blood knot.

**For loop-to-loop connections, the double surgeon's loop is the easiest knot to use because it is simple to tie.**

DOUBLE SURGEON'S LOOP



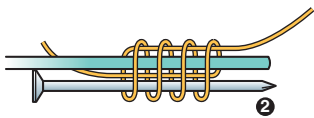
## Knots and Knot-Tying

Fly fishermen depend on knots and must know how to tie several different knots properly. A poorly tied knot will result in lost fish and great frustration for the angler. Well-tied knots ensure that all the elements of a properly matched fly-fishing outfit work smoothly together. Learn the essential fly-fishing knots and practice tying them. Some tips:

- Small-diameter monofilament is hard to work with. While learning and practicing, use something that has a larger diameter and is relatively stiff. If you can find an old discarded fly line, cut it into short sections to practice.
- When tying knots in monofilament, tighten gently and firmly.
- Lubricate knots with water before tightening. But do not put leader material that has been in a stream into your mouth. Just a few drops of stream water can carry harmful parasites.
- Clip knots closely and neatly, and check them often.

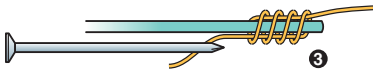
### Nail Knot (or Tube Knot)

Use the nail knot to tie fly line to the backing or to attach a leader to a line. This knot works well for tying together monofilament of different diameters. If you don't have a nail handy, use a substitute such as a thin tube.



**Step 1**—Hold the nail along the fly line and backing between your thumb and forefinger.

**Step 2**—Lay a loop of line along the nail and, with the free end, wind the monofilament around the nail, loop, and leader about six times.



**Step 3**—Hold the “coils” carefully between your thumb and forefinger. Remove the nail, and tighten the knot carefully, allowing the turns of leader to settle closely together.



**Step 4**—Pull both leader and line tightly and trim both.

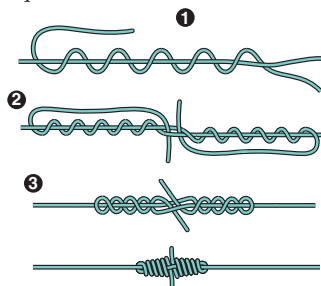
### Blood Knot (or Barrel Knot)

This knot works well for joining two sections of monofilament or leaders when the diameters of the lines are fairly equal.

**Step 1**—Overlap several inches of the ends of the lines to be joined, and twist them together around 10 times.

**Step 2**—Separate the center twist as shown and insert the ends through the twist as illustrated, each end in opposite directions.

**Step 3**—Pull on the two loose ends to tighten the knot, making it as small as possible. Clip the ends close to the knot.



### Improved Clinch Knot

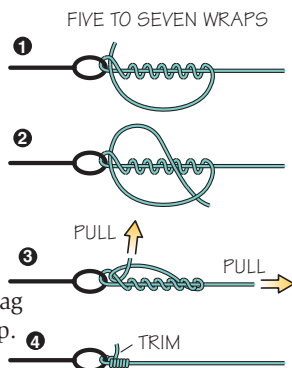
The improved clinch knot can be used to connect the fly to the leader. It works well for tying small flies.

**Step 1**—Run the end of the line through the eye, double the line back, and make five to seven wraps around the line, leaving a loop.

**Step 2**—Run the end of the line through the loop where the line joins the eye and then pass the line through the large loop.

**Step 3**—Partially close the knot and moisten it a little with water before securing it tightly against the eye.

**Step 4**—To make an unimproved clinch knot, pull the tag end and standing line tight after completing the first step.



### Turtle Knot (or Turtle Knot)

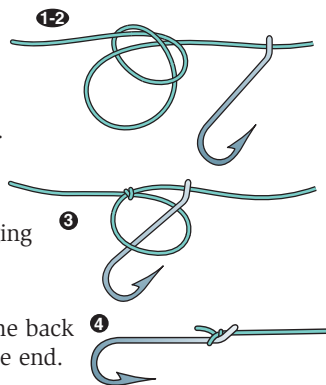
Use the Turtle knot to make a straight connection between the fly (hook shank) and the leader.

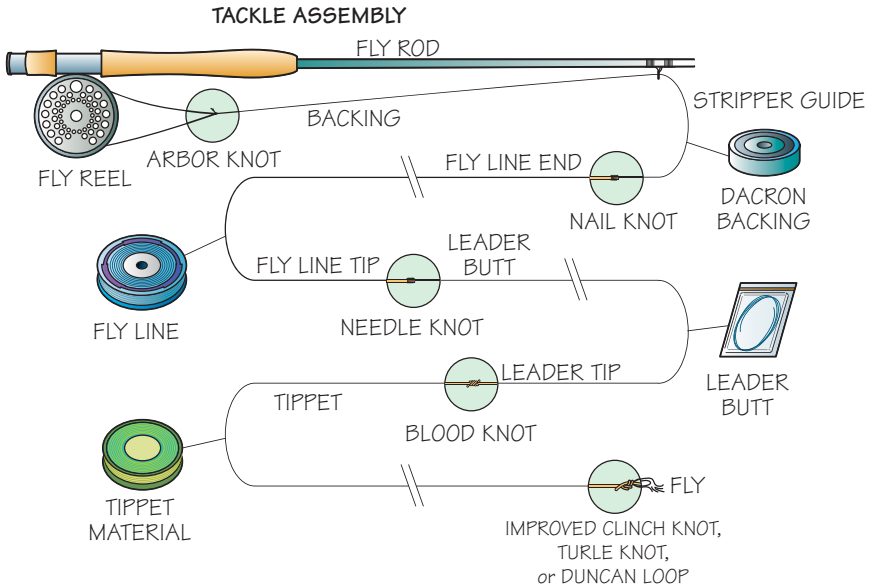
**Step 1**—Pass the end of the leader through the fly's (or hook's) eye from the front, as shown, and slide the fly up the leader so that it will be out of the way.

**Step 2**—Make a loop with a slipknot in the end of the leader.

**Step 3**—Pull the loop over and around the fly, bringing the free end around twice, like a double overhand knot, and tighten.

**Step 4**—Pull the leader and wrap the loop around the back of the hook's eye as shown; tighten and then trim the end.

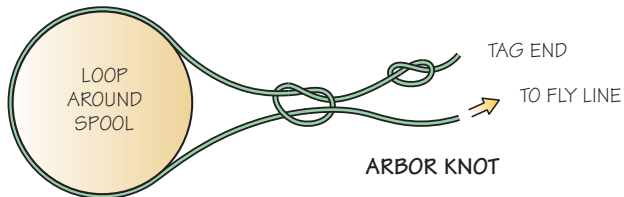




**Assemble the gear systematically for trouble-free performance.**

## Putting It All Together

All of the previously discussed elements of a properly balanced fly-fishing outfit must be assembled properly. Begin by attaching the reel to the seat on the rod. Make sure the handle is on the side of the hand you intend to reel with and the line guide of the reel is facing forward. Now, run the point of the backing through the stripping guide of the rod and attach the backing to the reel spool using an arbor knot.



**Attach the backing to the reel spool with an arbor knot. Pass the line through the stripper guide before tying the knot. After snugging the arbor knot tight, the line must then flow from the bottom of the spool back toward the stripper guide.**



Now, keeping the backing under tension, slowly wind it uniformly onto the reel. Reeling too fast without keeping tension in the line will cause the loops to work over each other, creating fouling (knots) that could mean the loss of a big fish when it takes you into the backing.

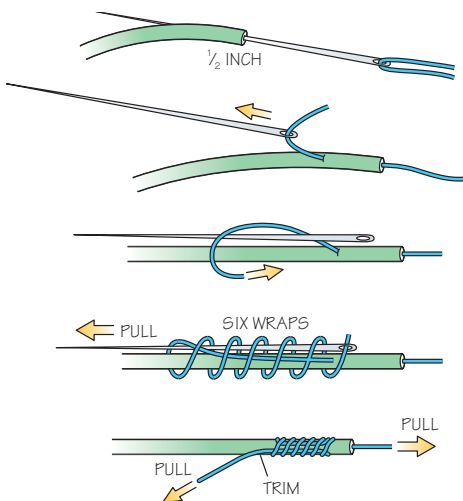
At the other end of the backing tie the fly line to the backing using the nail knot or needle knot, and finish the knot with a flexible adhesive such as Pliobond®. First make sure you still have enough room on the reel for the entire fly line with a little left over.

Now, wind the fly line onto the reel. Use less tension than you did with the backing. Be sure to leave enough room on the spool for the fly line with about a quarter-inch left over so you can easily change spools.

To connect the leader to the line, use a nail or needle knot or a loop-to-loop connection. You are now ready to string the line through all the guides of the rod and to begin casting.

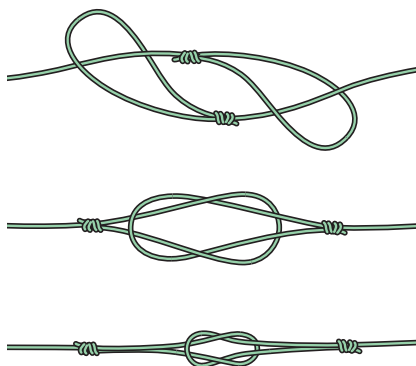
**Tip:** Attach a 2- or 3-foot section of heavy monofilament to the fly line with a needle knot. Tie a perfection loop in the other end then change leaders by means of a loop-to-loop connection.

### NEEDLE KNOT

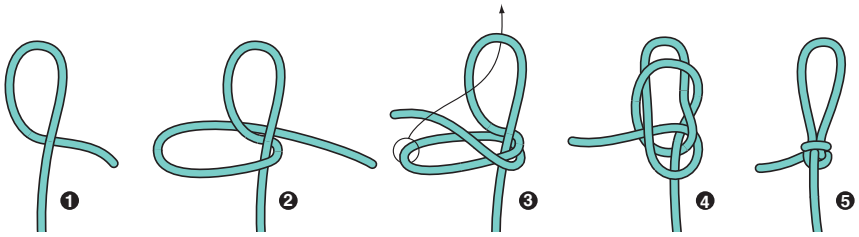


Use the needle knot to attach the leader butt to the fly line. Shave the butt end of the leader so it threads easily through the needle. Snug the wraps up carefully and evenly by pulling on the tag and standing parts of the leader.

### LOOP-TO-LOOP KNOT



Anglers use loop-to-loop connections to attach a tippet to the leader, leader sections to each other, or a leader to a permanent butt on the fly line.



### Perfection Loop

Some fly fishermen use the perfection loop to join a butt section (that has a perfection loop tied on the end) with a fly leader (that also has a perfection loop tied on the end).

**Step 1**—Make a loop as shown, with the tag end behind the standing line and facing downward.

**Step 2**—Make another, smaller loop over and behind the first one, with the tag end facing downward. Hold the loops in place between your forefinger and thumb.

**Step 3**—Pull the tag end between the two loops, in front of the larger loop but behind the smaller loop, as shown. (The tag now should face upward.)

**Step 4**—Holding the loops in place with your forefinger and thumb, pull the smaller loop through the larger one. (The smaller loop is the one you will end up using.)

**Step 5**—Adjust the smaller loop to the desired size (smaller is better), moisten it, pull it snug over the standing line, and trim the tag end closely.



## Other Equipment

In addition to a balanced outfit—rod, reel, line, and leader—and some flies, you may require other equipment. You may also want to acquire some slightly less essential—but still useful—equipment such as waders or boots, a fishing vest, and various accessories.

### Waders and Boots

Boots or waders are nice to have when wading in a cold stream. Felt soles provide traction on slippery rocks. Waders are a necessity for fishing trout or salmon streams, where the water is cold and the rocks can be slippery. Chest-high waders are more versatile than hip boots. Waders come in a variety of materials and styles. Make sure they fit comfortably and do not pinch. Keep a patch kit handy, and know how to use it. Leaky waders can result in an uncomfortable fishing trip.

### Vest

Fly fishermen need pockets where they can put fly boxes, tools, spare tippet spools, and other things. The answer is a vest with many large and small pockets. Some of the big pockets should have zippers. Use these to store those things you absolutely do not want to fall out into the water. Some pockets can be fastened with hook-and-loop fasteners for easy access. A very large pocket on the back of the vest is handy for storing rain gear and a lunch.



Slippery rocks, underwater obstructions, and strong currents all can make wading conditions challenging. So can soft mud or lakes with quicksand-like bottoms. A safe angler carries a wading stick to probe the bottom before taking the next step.



**Organize your vest so that you can find exactly what you need, when you need it. Also, keep one pocket for trash.**

### Accessories

Experienced fly fishermen have learned that a few well-chosen accessories can make a difference in their enjoyment of the fishing trip. Consider taking some of these items along.

**Sunglasses.** Polarized, glare-cutting glasses are great for helping spot fish in the water, for protecting your eyes from the sun, and from flying fishhooks.



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Sunglasses and a hat will not only provide protection from the sun, but also serve as an extra defense against a flying fishhook.

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**Hat.** For added protection from the sun, a baseball cap works OK, but a brimmed hat will also protect your ears and neck. A hat can also deflect a flying hook.

**Fly boxes.** These come in many styles. Several smaller boxes might be a better idea than a single large one. Put different styles of flies in different boxes.





**Small pliers.** This little tool is invaluable for releasing fish or crimping down the barb on a hook.

**Clippers.** Standard fingernail clippers or some variation are excellent for trimming knotted leader material.

**Hook sharpener.** A small file is a great tool for touching up the point of a dull hook.

**Line dressing and fly line cleaner.** Commercial products for keeping flies, lines, and leaders clean can come in handy.

**Duct tape.** This multipurpose tape can be kept on hand for small repairs.

**Bandanna.** Worn around the neck, this accessory has several uses, including cleaning eyeglasses.



**Small flashlight.** This will help light the path for evenings when you stay on the water until dark.

**Rain jacket.** Some varieties of this garment can be folded small enough to fit inside a tackle box or fishing vest until it is needed in an unexpected rain.





# Learning to Cast

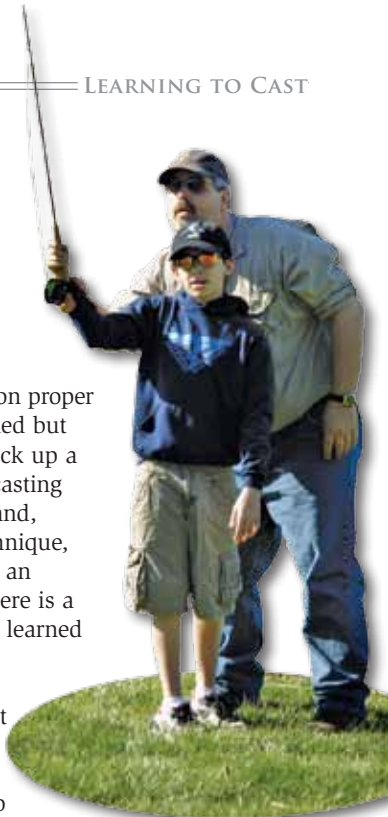
Fly-casting is a skill that depends not on strength, but on proper technique and timing. This means that it can be learned but that it requires practice. Almost nobody can simply pick up a fly rod—even a properly balanced outfit—and begin casting properly, accurately, and for distance. On the other hand, almost anyone who is willing to study the proper technique, listen to instruction, and practice can quickly become an accomplished fly caster. The key is to discover that there is a proper technique and that, through practice, it can be learned and mastered.

Learn to cast before you learn to fish. It is best to practice on water—preferably a pond where you do not have to contend with currents. Even if there are fish in the pond, do not try to catch them with a fly. Tie a small piece of colorful yarn to the end of your leader to imitate a fly. If a pond is not available, a yard or mowed field will do just fine. Be careful of obstructions, though, especially overhead power lines.

When you are learning to fly cast, it helps to learn from someone who knows how to cast. Members of local fishing clubs may offer casting and fly-tying classes. Fishing clubs and organizations also hold clinics at Scout jamborees and camps, some of them free. In addition, commercial clinics and schools can help you to learn proper technique from certified instructors.

Perhaps you know an experienced fly fisherman in your troop who can serve as your coach. Another option is to study videos and books to help you with your casting technique. You can learn this way, although it is harder than if you had personal instruction and it might take longer. But you *can* learn by practicing and by following some basic rules.

The Federation of Fly Fishers is a nonprofit organization with a threefold mission of conservation, restoration, and instruction. See the resources section at the end of this pamphlet for the FFF's contact information.



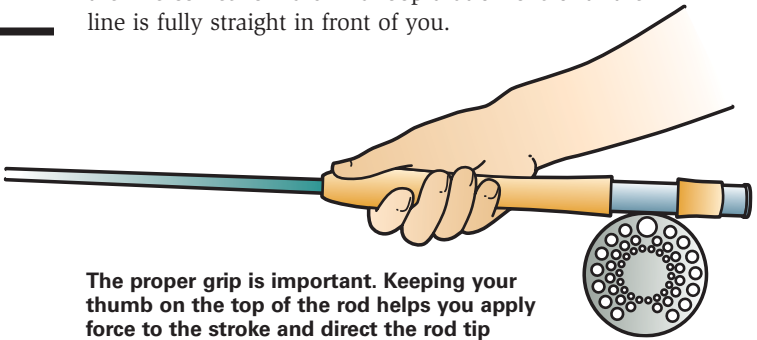
## Overhead Casting

Begin with the grip. Make sure your thumb is on top of the rod's cork grip and that you have a firm hold. Now, strip out 20 to 30 feet of line from the reel. You might want to mark that distance on your line. With that length of line in front of you, more or less in a straight line, start with the rod at a waist-high position, parallel to the ground or the surface of the pond.

Watch your back cast. You don't want to snag overhanging wires, trees, shrubs—or people!

On an imaginary clock, your rod tip should be pointed at the 9 o'clock position. Lift the rod tip by raising your forearm with a motion that is crisp but not sudden or violent. Let the rod tip pass through the vertical, or 12 o'clock, position then stop it abruptly. The rod should stop at the 1 o'clock position.

The line will continue to move behind you in a loop that will gradually straighten out. When the line is straight out behind you and roughly parallel to the ground, move the rod crisply forward, stopping it at about the 10:30 position. Then allow it to drift slowly back down to 9 o'clock as the line comes forward in a loop that unrolls until the line is fully straight in front of you.



**The proper grip is important. Keeping your thumb on the top of the rod helps you apply force to the stroke and direct the rod tip accurately and in plane.**



Casting in windy conditions can cause a fly to behave unpredictably. When the wind makes casting difficult, try moving a few yards to the left or right. Doing so will sometimes help by shifting your

body and fly away from the wind's direct path. It may also keep you from getting hit by your own fly.

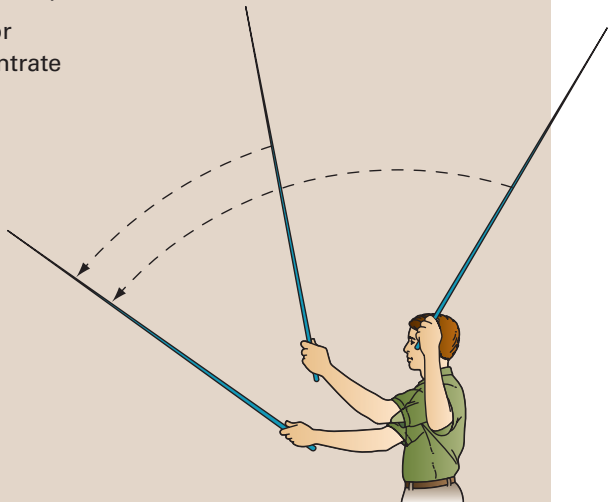


## Casting at a Glance

These are the essential points to remember as you practice casting.

- Pick up the line cleanly with a crisp forearm movement that takes the rod tip from 9 o'clock to 1 o'clock. Remember to abruptly stop the rod tip at the 1 o'clock position.
- Pause at the top of the back cast to let the line unroll and straighten out behind you. Turn your head and watch to make sure this is happening. If you bring the rod tip forward before the line straightens out, you will hear a crack, like the sound of a whip, and the line will pile up on the forward cast. If you wait too long, the line—and fly—will fall onto the ground or water behind you.
- Bring the rod tip forward with a smooth but powerful forearm motion from 1 o'clock to about 10:30.
- Keep the wrist fairly stiff and use the forearm in an up-and-down motion to move the rod.
- Do not overpower the rod. Let it do the work.
- Keep the slack out of the line with the hand you are not using for casting. Extend the arm that holds the line as you make the back cast with the other arm. This will draw the slack out and enable you to keep a tight line and loop.

Practice this technique for 15 minutes a day. Concentrate on making a tight, clean loop with the line and getting it to lie out straight in front of you when you have finished a cast. Do not go for distance until you are able to accurately cast about 30 feet of line.



### Going for Distance

As your technique improves, you can work with more line. Distance in fly-casting is achieved by **shooting the line** on the forward cast. A proper power stroke will have put enough momentum to the line that it can pull more line through the guides if you have first stripped it from the reel. Hold a couple of coils of slack line in the hand you are not using to cast—this is your **line hand**—and release these coils when you have finished the power stroke—at 10:30—and feel the loop straightening out in front of you. The slack line will be pulled through the guides.

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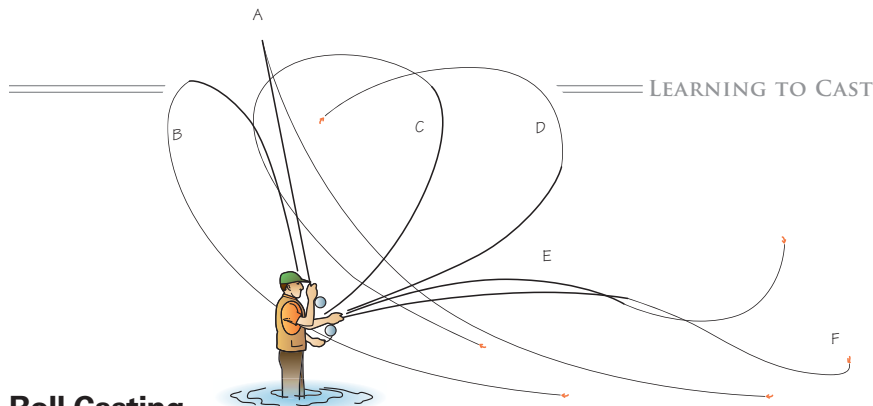
A large plastic hoop (such as a hula hoop) makes an excellent target for practicing casting.

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### False Casting

If you have made the forward cast and, instead of softly lowering the rod tip and letting the line and fly settle on the water, you execute another back cast with the fly still in the air, you are false casting. False casting allows the angler to change directions from cast to cast without disturbing the surface of the water and to add more length to the cast. It is also a good way to dry a fly that has soaked up too much water. Practice false casting 30 feet of line. Much more than this is unwieldy.



## Roll Casting

If there is heavy brush behind you, or if you have a lot of slack line on the water in front of you, the **roll cast** can be a useful technique. To keep line from going behind you on the back cast, raise your rod tip (A) and keep it moving until it is slightly beyond vertical—at 1 o'clock. The line will form a soft loop (B), part of which will be behind you. Snap the rod forward (C) and the line should roll out straight in front of you (D, E, and F).

## Practice Your Casting Technique

As you practice casting, remember these tips:

- Learn to feel the tug of the line when it straightens out behind you on the back cast. This is the signal to start the forward cast.
- Learn to use the weight and speed of the line to make the fly rod work for you.
- Work on accuracy. The line and fly will travel in the direction in which your thumb ends up.
- When rigging the rod, double the fly line when you run it through the guides. If you lose your grip, the line won't fall back through the guides you have just strung.
- Exaggerate the up-and-down motion of your forearm when you are learning to cast. Don't be afraid to look behind you to see the action of the line and leader.
- Remember that the roll cast has a vertical stopping point of 1 o'clock. The roll cast is essentially half a cast. It uses the same grip and the same vertical stopping point as the full back cast. As such, you may wish to perfect your roll cast technique before progressing to the full, traditional back cast.





# All About Flies

Fly-fishing is done with artificial imitations of natural foods (insects, minnows, and so forth). The angler presents a hook that has been dressed with feathers, fur, and other materials—both synthetic and natural—in an attempt to trick a fish into striking. These artificial lures are called **flies**, even when they imitate fish, crabs, or, in some cases, nothing in particular. Each fly is tied according to a **pattern**, and fly tiers are constantly developing new patterns that vary in presentation—each with the hope of hooking choice fish.



## Types of Flies

Although many of the lures fly fishers use to catch fish are designed to duplicate the immature and adult stages of aquatic insects such as mayflies, dragonflies, and midges, many other types of fish food are represented by flies, including baitfish, leeches, worms, and crustaceans. The term *fly* is only generic; it does not necessarily refer to flying insects.

Today's fly tiers can create flies that mimic aquatic insects in all their life stages, nymph, hatching forms, mature, and even "spent" insects. Many fly tiers familiarize themselves with entomology, the study of insects, to improve their fly-tying skills.

The following charts list the types of patterns that have been designed to imitate live baits for certain fish.

## Dry Flies

Use these dry flies to catch trout, bass, and panfish in rivers and lakes.

PATTERNS	MATCHES
Adams	Mayflies, midges
Compara-Duns	Mayflies, midges
Elk-Hair Caddis	Caddis
Light Cahill	Tan mayflies
Grasshopper	Grasshoppers
Ants	Ants
Beetles	Beetles
Small Poppers	Frogs, water bugs
Large Poppers	Frogs, water bugs

## Dry Flies

Traditional trout flies that float are called **dry flies**. They are designed to imitate the adult forms of mayflies, caddis flies, and other insects that trout and other fish feed on. Anglers use dry flies to catch fish that are feeding on surface-hatching insects. The dry flies are tied in patterns to look like the specific species of insect. This is called **matching the hatch**, and it is one of the most important principles in fishing. If you see fish feeding on a specific insect then you should use a fly that closely imitates this food source. Good casting with the wrong fly can result in a lot of refusals by fish and a lot of frustration for the angler.

Dry flies



## Nymphs (Wet Flies) and Streamers

While most anglers consider dry fly-fishing to be the most exciting form of fishing—because the strike of the fish can be anticipated—fish do the bulk of their feeding beneath the surface, where mayflies and other aquatic insects spend most of their lives, from egg to adult form. Flies that are fished beneath the surface are called **wet flies**. They often imitate aquatic insects in the nymph or pupae stage that are struggling to reach the surface. Flies called **streamers** also are fished beneath the surface.

### Nymphs (Wet Flies)

Use these nymphs to catch trout, bass, and panfish.

PATTERNS	MATCHES	WHERE TO FISH
Hare's Ear	Mayfly nymphs	Streams, lakes
Pheasant Tail	Caddis, mayfly nymphs	Streams, lakes
Squirrel Hair	Golden stoneflies	Rivers, lakes
Woolly Bugger	Stoneflies, leeches, damsel nymphs	Rivers, lakes
Zug Bug	Caddis pupa	Rivers, lakes
Brassie	Midge pupae	Rivers, lakes
Damselfly	Damsel nymphs	Rivers, lakes
San Juan Worm	Red worms	Rivers, lakes

#### Nymphs (Wet flies)

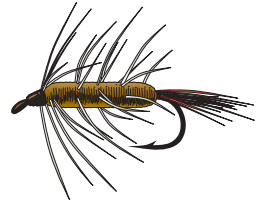
GOLD-RIBBED HARE'S EAR



PHEASANT TAIL



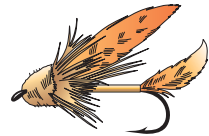
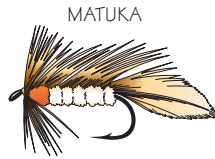
WOOLLY BUGGER



## Streamers

PATTERNS	MATCHES	WHERE TO FISH	SPECIES
Clouser minnow	Baitfish	Saltwater	Saltwater fish
Clouser	Baitfish	Rivers, lakes, saltwater	Trout, bass, panfish, saltwater fish
Muddler minnow	Sculpin	Rivers, lakes	Trout, bass, panfish
Zonker	Baitfish	Rivers, lakes, streams, saltwater	Trout, bass, predators
Bucktails	Baitfish	Rivers, lakes, streams, saltwater	Bass, other predators
Woolly bugger	Baitfish, leeches	All waters	All predators
Girdlebug	Aquatic bugs, attractor fly	Ponds, lakes, streams	Trout, panfish, bass

Streamers



MUDDLER MINNOW



Scout's learn to look beneath the water's surface to see what fish are eating. Here, they find nymphs and caddis cases.





### Bass Bugs and Saltwater Flies

A popular fly in bass fishing is the **popping bug**. This fly consists of a cork or hair body that is attached to a hook and **dressed** with some feathers and fur and perhaps some short pieces of pliable rubber. They imitate a large insect or frog. Anglers use the fly line and rod tip to impart some action to these bass bugs and make a popping noise on the surface of the water. Such action can arouse the curiosity of a fish and get it to strike.

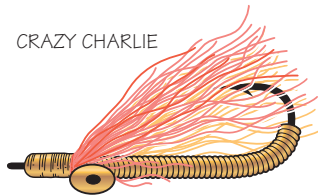
Saltwater fish do not feed on insects, so anglers tie saltwater flies to resemble small fish, shrimp, or crabs. Saltwater flies are larger—sometimes much larger—than trout flies. Flies tied to imitate the kind of fish that a tarpon, for instance, would feed on can be 6 inches long.

Among the most intricate and beautiful flies are those designed to catch Atlantic salmon. The **recipe** for some salmon flies requires the use of more than two dozen different feathers and materials. At the other extreme, some flies that are designed for steelhead fishing are tied to look like salmon eggs and are nothing more than some gaudy floss or fabric tied in a clump around the shank of a hook.



### Saltwater flies

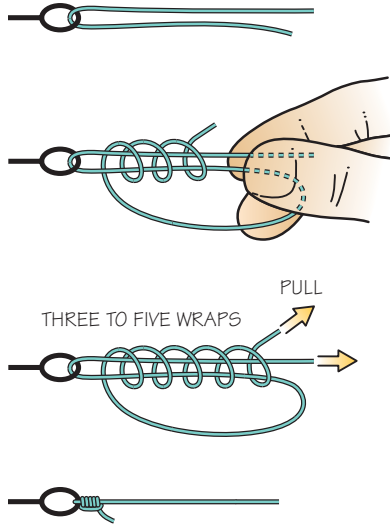
CRAZY CHARLIE



## Attaching the Fly to the Leader

Fly fishermen use several kinds of knots to attach the fly to the leader. This includes the Duncan loop or “Granny jam,” which works well for larger flies—especially saltwater flies—that need to “swim” naturally through the water when being retrieved.

DUNCAN LOOP



**Leave the loop open to allow the fly to swing freely, or close the loop tight.**

## Tying Flies

Flies are sold commercially in stores through mail order and online. Many anglers, however, tie their own flies. This saves money and also provides a satisfying hobby, although it is a demanding skill. Most serious anglers have tried fly tying and are familiar with the basics, even if they buy their flies from a commercial source. Some anglers even carry a portable fly-tying kit with them when they go fishing and sit on the bank of a stream to tie up flies that match what they see hatching.

## Patterns

Fly patterns are basic designs tied to match a live insect or bait when fished under certain conditions. Patterns call for standard hooks and materials, but experienced fly tiers can modify an existing design to match the color, size, or shape of the “real” fish food that exists in the area. For example, if trout on a particular stream seem to be feeding on a certain color and size of mayfly, the angler can modify a basic pattern to tie a fly that specifically matches the real mayflies in size and color.

Learning to tie a few of the basic patterns will allow a beginning fly tier to imitate the characteristics of a fly enough to make an informed judgment about which type of fly will catch the biggest fish. Fly tying takes practice, but the enjoyment of trial and error can be half the fun; catching fish on flies you have tied is the other half.

## Streamer Construction

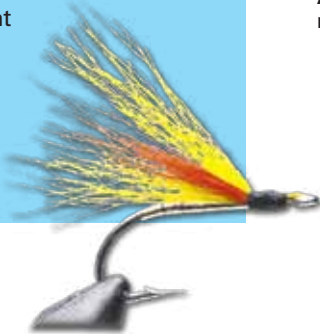
Streamers come in a wide range of sizes and are tied with a variety of materials. The recipe may include deer hair, bucktail, rabbit fur strips, hackles, and synthetic materials. Adding eyes to the larger patterns can often make them more effective.

This traditional fly, known as the Mickey Finn, is easy to tie. You can incorporate variations by using different colors of bucktail. The Mickey Finn can be used to catch any species of fish. Practice tying this fly to learn the basics of fly tying.

Size, color, and shape are three of the most important characteristics of any fly.

## Mickey Finn Recipe

- Standard 4X long streamer hook (sizes 6 to 12)
- Fly-tying thread (black 6/0)
- Flat gold fly tinsel or oval gold fly tinsel
- Red- and yellow-dyed bucktail
- Fly-tying cement
- Vise

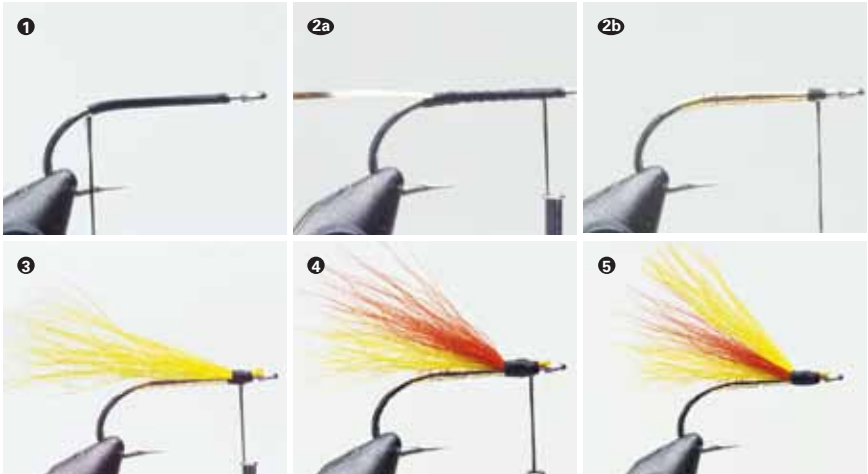


A vise like the one shown here makes fly tying go smoother.

## TYING THE MICKEY FINN

**Step 1**—Secure the hook in the vise as shown. Then, fasten the thread at the hook's eye.

**Step 2**—Measure a piece of tinsel about 6 inches long. Wrap the thread around the end of the tinsel to tie it onto the hook. Wrap the tinsel neatly to the bend of the hook and back over itself. Tie off the tinsel with the thread and trim the excess tinsel.



**Step 3**—Begin tying on the wings by laying yellow bucktail at the top of the hook to the left of the eye. Secure the bucktail with several wraps of thread. Trim ends at the eye.

**Step 4**—Create the second layer of bucktail by repeating step 3, laying the new, contrasting color (red) of bucktail over the first.

**Step 5**—Add a final layer of yellow bucktail over the second layer, securing the layer with several wraps of thread. Trim bucktail ends in a nice taper close to the head. Make the head by wrapping the thread neatly in a taper toward the eye of the hook. To make the head look more “graceful,” finish it by tucking the thread underneath one or two loops (half hitches), then trim the thread as close as possible. Use a bit of fly-tying cement to ensure that the head does not unravel.

## Pheasant Tail Nymph Recipe

- Standard to 2X stout streamer hook (size 14)
- Fly-tying thread (black 6/0)
- Fine copper wire
- Gray dubbing (tail fibers)
- Peacock herl (6 strands)
- Small patch of turkey feather (6 to 8 barbs)
- Center tail fiber tips of pheasant (6 to 8 barbs)
- Vise



### TYING THE PHEASANT TAIL NYMPH

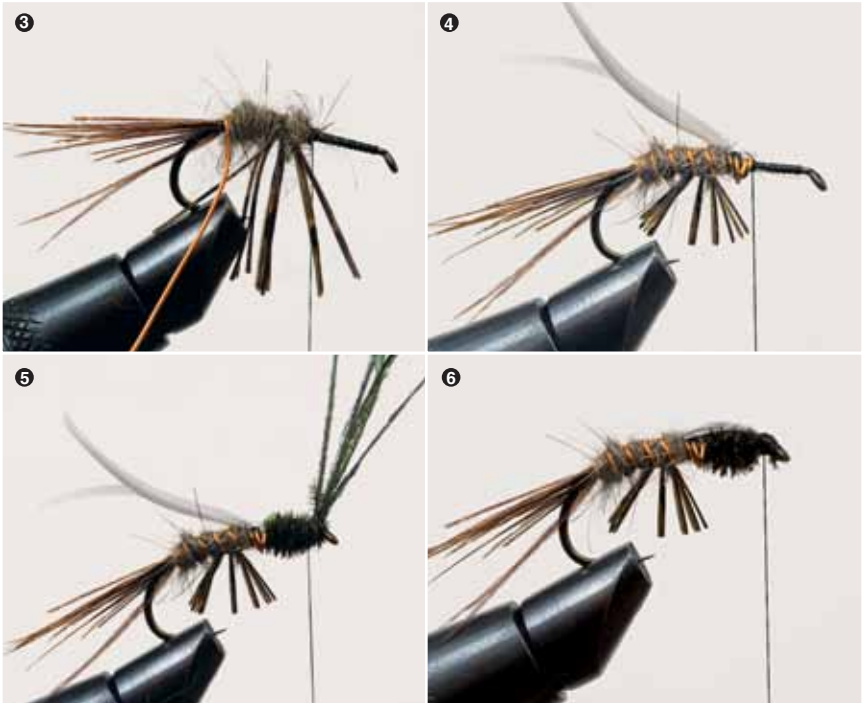
**Step 1**—Secure the curved end of the hook in the vise so that you can easily maneuver thread and other materials around the shaft end. Begin the body by wrapping the thread from just below the hook's eye to where you want the tail to separate from the hook.



**Step 2**—Form the nymph tail by tying in 6 to 8 barbs of pheasant tail. The reddish tips will show when the fly is finished.

**Step 3**—To make the abdomen and legs, tie in the copper wire. Then, twist the dubbing into a small clump and use the wire to wrap it and the pheasant barbs evenly to about a third toward the eye. Make the legs by rotating the barbs to be underneath the top the abdomen and tying them in place. Trim the legs.

**Step 4**—Make the wing case by tying in the turkey feather pointing to the rear with the dark side down. Secure with a half hitch. Make the thorax by tying in each peacock herl. Trim the excess thread.



**Step 5**—Roll the turkey feather to the front and tie the wing case with three wraps at the center top. Tie off the thread with a half hitch and trim the excess.

**Step 6**—Trim down the excess turkey feather, and use a bodkin, a small, needlelike fly-tying tool, to fluff the fibers.

## Tan Elk Wing Caddis Recipe

- Mustad® No. 94804 streamer hook or equivalent (size 12)
- Fly-tying thread (tan 6/0)
- Light dun hackle
- Gray dubbing (rabbit or muskrat fur)
- Dyed tan elk hair
- Fly-tying cement
- Vise



### TYING THE TAN ELK WING CADDIS

**Step 1**—Secure the curved end of the hook in the vise so that you can easily maneuver thread and other materials around the shaft end. Then, wrap the shank with thread from just below the hook's eye until it is even with the hook point.

**Step 2**—To create the body, tie on the hackle. Twist the dubbing into a small clump that covers three-fourths of the shank. Wrap the hackle around the dubbing and the shank toward the eye about five turns (this is called palmering). Tie off the hackle and trim the excess.



**Step 3**—To make the wings, cut and stack a pinch of elk hair. Lay it on the hook, leaving some room to finish the head. Wrap the hair three to four turns at the top of the dubbing and wrap back.



**Step 4**—Finish the head by wrapping the thread three or four times, and finish with several half hitches. Trim the hair on an angle. Apply a bit of fly-tying cement to the thread on the underside so it does not unravel. Use a bodkin to pick at the underside to make legs.



Many anglers consider fly tying to be an art in itself, apart from the actual use of their flies on the water.

They use many specialized tools and materials for this craft.

You might wish to look at a commercial sporting-goods catalog just to marvel at the huge selection of flies and fly-tying materials. In earning the Fly-Fishing merit badge, you will need to learn only the basics of fly tying. Consult the resources included at the end of this pamphlet to learn more about the art of fly tying.



## Royal Wulff Recipe

- Partridge® wet fly streamer hook or equivalent (size 10)
- Fly-tying thread (black 8/0)
- Glossy fly-tying thread
- Golden pheasant crest tips
- Peacock herl
- Brown hackle
- Red silk floss
- White goose shoulder
- Vise



### TYING THE ROYAL WULFF

**Step 1**—Secure the curved end of the hook in the vise so that you can easily maneuver thread and other materials around the shaft end. To make the tail, attach the thread to the shaft a little more than halfway from the eye. Attach a pinch of pheasant crest tips with as many wraps of the thread as it takes to secure them.



**Step 2**—To make the lower body, attach the peacock herl and wrap two or three times. Tie it off and trim the excess.

**Step 3**—Continue to form the body by attaching the red silk floss, and continue wrapping the shaft toward the eye, leaving room to attach the wing. Tie off the floss and trim the excess.

**Step 4**—To make the upper body, attach more peacock herl and wrap two or three times to match the lower portion. Leave enough room near the eye for the wings and the head. Tie off the herl and trim the excess.



**Step 5**—Make the wings by attaching the hackle and wrapping it a few times toward the eye, leaving enough room for the head. Tie the hackle off and trim the excess. Then, attach the goose shoulder with a few turns of the thread.

**Step 6**—To make the head, attach the glossy thread and make as many wraps as needed to make the head. Tie off the thread with a half hitch. To finish, use a bodkin to pick at the wings and any other area to make it fuzzy.

## Fishing Dry Flies

When you fish a dry fly, you cast either to a fish you have seen feeding—“a rising fish”—or to a location, or **lie**, where you think a fish will be holding and waiting for food to pass above. The fly should drift without “dragging” over the head of the fish and look natural to it. If you are fishing in water with current, cast far enough upstream to give the fly a chance to float down over the lie, where you have seen the fish or think it is holding.

When fishing dry flies in moving water, an angler must contend with **drag**. This occurs when the line moves down current ahead of the fly and pulls it along. This will create a wake and look entirely unnatural to a fish. Anglers traditionally have cast upstream with dry flies to avoid drag.

When anglers must cast across current, they can throw an upstream “bend” into the line with a **reach cast** or **mend**. After completing the power stroke, the angler reaches upstream with the arm and rod tip. This sends the belly of the fly line up current.

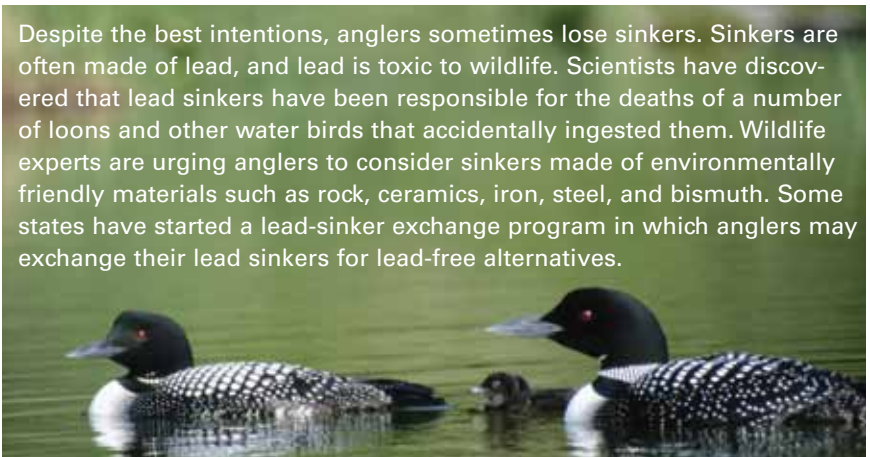
An angler also can put slack into the line by waving the rod tip back and forth at the end of the power stroke, throwing S-curves into the line before it lands on the water. Another option is to use a **parachute cast**, in which the angler stops the rod abruptly at the end of the power stroke. This puts slack loops into the line before it lands on the water. Raise the rod tip to set the hook with dry flies. If you miss, you can deliver the fly right back to the same spot on the next cast.

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Experiment and practice your casting to gain control and confidence.

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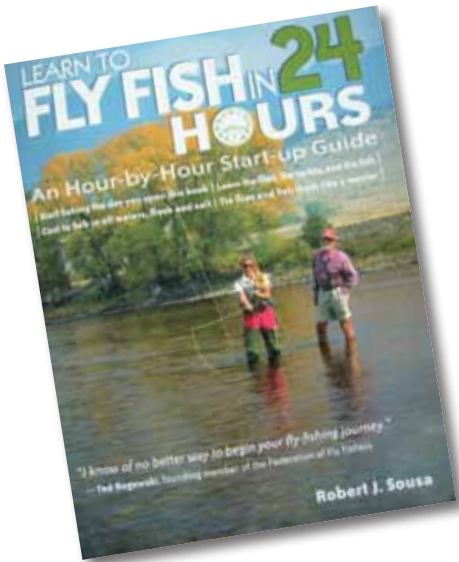
Despite the best intentions, anglers sometimes lose sinkers. Sinkers are often made of lead, and lead is toxic to wildlife. Scientists have discovered that lead sinkers have been responsible for the deaths of a number of loons and other water birds that accidentally ingested them. Wildlife experts are urging anglers to consider sinkers made of environmentally friendly materials such as rock, ceramics, iron, steel, and bismuth. Some states have started a lead-sinker exchange program in which anglers may exchange their lead sinkers for lead-free alternatives.



## Fishing Sinking Flies

When fishing sinking flies in moving water, the anglers control the line by keeping the casts relatively short. They cast upstream and follow the drift of the fly with the tip of the rod, raising the rod as the fly swings downstream to keep slack out of the line. Watch carefully where the leader is tied to the fly line. When it stops—or when you see a flash in the water beyond this point—tighten up with the line hand and lift with the rod hand to set the hook. If you do not strike quickly, the fish may spit out the fly. Some anglers use a small piece of bright yarn or cork on the line as a **strike indicator**. When the indicator stops moving or dips under the surface, the angler strikes.

Streamers and saltwater flies are tied to look like minnows or bait fish. These flies are fished deeply in a lake or stream when fish are not at the surface. They should be moved through the water by short, quick strips of line with the line hand. You also can impart movement to a streamer by moving the rod tip slightly. When fishing nymphs and streamers, use the line hand to set the hook. Even if the fish misses, you will not drag the fly very far away from its view, and the fish may still wish to pursue it.



Many additional sources of information are available to you to take your fly-fishing skills to the next level. Inspired by Boy Scouts like you, angler Robert J. Sousa wrote *Learn to Fly Fish in 24 Hours*.

## Fly Selection Tips

Some tips for choosing and tying flies include the following:

- The same types of mayflies hatch year after year and at roughly the same time of year on most trout streams. Therefore, the same fly patterns work on these streams, year after year, in the right season. Know what flies generally work and make sure you have some in your box.
- If the pattern you are using doesn't work but you think you have matched what is hatching, try going up or down one fly size.
- If nothing is hatching but you see trout rising, try a very small fly—especially if the fish are rising softly. They could be taking very small flies—midges—in the surface film or nymphs just below the surface.
- If nothing is rising but you want to prospect with a dry fly, try one of the reliable attractor patterns like a Royal Wulff or a Humpy. These patterns seem to imitate a broad cross-section of insects and they have caught a lot of fish.
- If a bass bug isn't getting any strikes and you have been giving it some action, try letting it rest motionless. Sometimes fish will take it when it hasn't been moved at all.
- Check the hook on the fly often. Remove any debris. The point of the hook should be sharp enough to scratch the top of your thumbnail. The barb will sometimes break off during casting (for example, if it hits a rock).
- If the fly is of a lighter color than the naturals you see, darken it with a permanent marker.





# Where to Fish

To survive in a lake or stream, fish need unpolluted water, a source of food, and shelter that will protect them from predators. Often fish will find food and protection at **edges**. An edge is where two things come together, where something ends and something else begins. If you are fishing a pond, there is an obvious edge where the shallow shore water meets deeper water. This is where you will find fish. When you study water, trying to decide where the likely spots might be, look for edges.

You also may find fish where a gravel bar or sandbar drops off into deeper water. A stump or a fallen log creates an edge effect, and so does a weed bed. In moving water, fish lie where one line of current meets another or where the current breaks up around a rock, creating slack water or an **eddy**. Trout that are feeding on floating insects, like hatching mayflies, will take a position where the current brings the food down to them. Look for these feeding lanes. In salt water, a feeding place might not be visible. It could be a tide that is carrying bait, a deep hole, or an eddy near a rock.

Sometimes, you will be able to see the fish. This is especially likely in salt water when fish are cruising in shallow areas, looking for food. But you also can spot fish by the rise, or action a fish makes as it comes to the surface to feed. You can spot trout in shallow, moving water by the shadow they leave on a sand or gravel bottom or by the flash when they move to take a nymph or some other kind of food.

Remember, if you can see the fish, they can likely see you, so move slowly and wear clothing in colors that match your surroundings.



To spot fish in the water, you need a pair of polarized sunglasses to cut the glare. Do not stare at one place for a long time; rather, keep your eyes moving. Don't expect to see the fish in full profile. Look for a shadow, a part of the fish, a slight movement, or a flash. Once you have spotted one of these signs, you will be able to pick out the entire fish. Some saltwater species, like bonefish and redfish, feed in water so shallow that their fins and tails sometimes show above the surface. Casting to a feeding **tailing fish** is one of the great thrills of saltwater fly-fishing.

Schooling fish, especially in salt water, can be located from a distance by the presence of birds that are feeding on the same baitfish the game fish are eating. Anglers who fish for bluefish, striped bass, and false albacore look for flocks of birds just above the surface of the water, diving into the schools of baitfish. Fish can be spooked easily, so you may be more successful by casting around the edge of a school rather than directly into it. Fish also gather around moving water like inlets or tidal guts. Often predatory fish will try to ambush their prey in the areas of turbulent water.

### Kinds of Fish

The types of fish that can be caught by fly-fishing are almost as numerous as the fish themselves. While this sport is often equated with trout, salmon, and other brook- and river-swimming fish, almost any species of fish can be caught with a fly.



## Freshwater Fish

Lakes, ponds, rivers, and streams are home to many hard-fighting and tasty species.

**Largemouth Bass.** No fish was more aptly named than the largemouth bass. Its jaw extends well back past its eye, and when it opens its mouth to swallow something, it seldom misses. Because it often strikes explosively on the surface, the largemouth is one of the most prized and highly sought game fish in North America.



In the South, largemouth grow to 20 pounds or more. In the North, 10 pounds is a record-breaker. Largemouth are structure fish, meaning they hang around brush, fallen trees, weed beds, and ledges, usually in fairly shallow water. Where they are heavily fished, they become cagey, and the angler must be careful, quiet, and skillful to be successful.

In areas where fishing pressure is heavy, many anglers release the bass they catch, perhaps keeping one or two small ones for supper. Small bass are excellent eating; big bass are not as good.

**Smallmouth Bass.** Averaging between 4 and 6 pounds, the smallmouth bass has been described as “pound for pound, the gamest fish that swims.” Many anglers will argue for other species, but there is no question that this snub-nosed, jut-jawed warrior of the cold water is a foe to test the tackle of any angler.



Smallmouth once were confined to the eastern United States but have been stocked over all of the northern states, much of Canada, and parts of the southern United States. Fly-fishing techniques work very well on smallmouth, especially in the rivers where they will feed aggressively on deer-hair bugs and other artificials fished on the surface.

The easiest way to distinguish the smallmouth from its largemouth cousin is by the upper jaw. In the smallmouth bass, the jaw comes back to a point just to the eye. In the largemouth, the upper jaw ends behind the eye. Also, smallmouth are yellow or tan with brown markings. The largemouth is greenish-gray with black markings. Both fish are known as black bass.

**Striped Bass.** Originally a saltwater species, several hundreds of these fish were trapped while spawning in the Santee River when the dam was built for South Carolina's Santee-Cooper hydroelectric project in 1938. Surprisingly, the stripers adapted to freshwater, spread over the reservoir, and grew rapidly, some to more than 40 pounds.



Most fly-fishing for the freshwater striped bass is for the smaller fish, which school on the surface and can be spotted feeding. They are strong fighters and are usually taken on heavier fly tackle.

**Panfish.** This year, a million American young people will be introduced to the sport of fishing. Most of them will catch a species of panfish. Aptly named, the species that are lumped together in this category are some of the tastiest in the frying pan. They also are fun to catch, and some are ferocious battlers for their size.

**Rock Bass and Bluegill.** The rock bass, of the sunfish family, is brassy color with rows of black scales. A stubby fighter growing to 2 pounds, it will strike almost any kind of live bait or artificial lure. It likes to hang out around old bridge piers, docks, boulders, and weed beds. Except in the late fall when it goes deep, the rock bass is a shallow-water feeder that likes to take minnows and bugs near the surface.



The bluegill, like many of the sunfish, has a shiny, dark blue patch on the edge of the gill cover. Like its sunfish cousins, it is brightly colored. The bluegill has purplish sides with black bands and a bright yellow or orange throat. It has a small mouth, and anglers use small hooks to catch it. Bluegill are found just about all over the United States. They are tough fighters and are superb eating. They are often taken on small popping bugs with rubber legs.

**Crappie.** Crappie are white and black fish that may grow to 4 pounds, although a 2-pounder is considered a trophy in most areas. It will take flies, especially woolly buggers, without hesitation. The crappie has a paperlike mouth and must be carefully handled so that the hook does not pull loose. It is excellent eating.

## Stream Trout

For sheer beauty, the members of the trout family are hard to beat. They are sleek, colorful, and built for speed through the water.

**Brook Trout.** A dark green back with yellowish tracks, spotted sides with bright red spots, red fins, and a white underside mark this all-American warrior. Brook trout are found in tiny beaver brooks as well as the great rivers of the North. In lakes they reach 7 to 8 pounds, but the average brookie is under a pound. Brook trout can be caught on dry or wet flies.



**Rainbow Trout.** Aptly named for the bright red streak down its silvery side and its bluish-green back, the rainbow trout is not only a handsome fish but also one of the most spectacular leapers among freshwater species. There are many varieties of rainbow trout, some growing to more than 20 pounds. The migratory steelhead, a fish that spawns in streams but spends most of its life in salt water or the Great Lakes, is a cousin.



**Brown Trout.** This European import has taken hold in many of the warmer streams that will not support native American species. It is stubbier than most trout, yellowish-tan with brown and red spots, shy, and is the wariest of the trout. Planted in the Great Lakes, it grows to more than 20 pounds.



### Saltwater Fish

Fly fishermen fish for many species of saltwater fish. Because saltwater fish are usually much larger than their freshwater cousins, anglers casting for them require specially designed rods and lines. Some of the species can be taken on a regular fly rod, but extra care must be taken to clean, rinse, and lubricate the equipment to reduce the corrosive effects of seawater.



### Flats Fish

Three species of fish that live in the shallow, subtropical waters of Florida are among the finest fly-fishing trophies. These are the tarpon, bonefish, and permit.

**Tarpon** are the largest of the three and can reach weights of more than 150 pounds. They are spectacular jumpers and are sometimes called “silver kings.”

**Bonefish** seldom grow to more than 10 pounds. They feed in very shallow, clear water, which makes them exceedingly wary, and when they take a fly, the angler will experience the thrill of one of the longest, fastest first runs in all of fishing.

The **permit** is found on some of the same flats where anglers look for tarpon and bonefish. It is rare, wary, and very hard to catch. Many expert anglers have never caught a permit and would consider their first the fish of a lifetime.

**Shallow-Water Species.** Spotted sea trout and drum are abundant and easily caught where they swarm in coastal bays and lagoons and at river mouths. They will hit streamer flies, and in some cases, skipping bugs work rapidly along the surface. Spotted sea trout and drum are good eating.

Redfish live along the Gulf Coast and southern Atlantic. They can be found cruising and feeding in shallow water where they will take a fly after a careful presentation. Redfish are terrific fighters and excellent table fish.



## Striped Bass

The striped bass is a native of the Atlantic. On the East Coast, it can be found from Chesapeake Bay to Maine. It has been widely transplanted in both freshwater and in the Pacific, especially around San Francisco Bay. In the shallow-water flats of Long Island and around Cape Cod, fly rodders spot cruising and feeding fish and take them on flies. They are excellent fighters and, after many years of scarce stocks, are now plentiful enough that one may occasionally be kept for eating.

## School Fish

Bluefish are among the most aggressive of all salt-water fish. They have razor-sharp teeth, so use a short piece of wire leader when fishing them or any other fish known to have sharp teeth. Anglers take bluefish on flies that imitate small minnows. Bluefish usually are found schooling and are located by the birds that flock over to eat the baitfish they chase to the surface. False albacore are tunalike fish that also school on the surface. Many anglers will claim that false albacore are strong fish that fight harder than anything in the ocean.



# Hooking, Playing, and Releasing Fish

## Hooking a Fish

To set the hook quickly, the fly fisherman often uses the line hand and not the rod. This is especially true for flies fished underwater. When a fish takes the fly, the fish will spit it out upon discovering it is not real food. The rod flexes and is difficult to control. When an angler tries to set the hook by raising the rod tip, he often will pull the hook out of the fish's mouth. On very big fish such as tarpon, a long pull with the line hand followed by a sharp raising of the rod hand usually will set the hook.

Many fly fishermen use either barbless hooks or, if the hook they are using does have a barb, flatten the barb with pliers. Barbs tend to damage a fish's mouth more than necessary and may make releasing the fish difficult. Barbless hooks make releasing a fish easier and cause less trauma if they become lodged in an angler's skin.



If using a barbless hook, be sure to keep a tight line when playing a fish, as it will sure help you to land the fish.

## Playing a Fish

Play the fish aggressively but not to exhaustion. Try to turn its head and make it fight against the full flex of the rod, not just a slight bend at the tip. Do not play a fish too long—it will become exhausted and might not recover if you release it, or it might be too weak to escape from predators.



## Releasing a Fish

Releasing fish is an important conservation measure. **Catch and release** is a concept that fly fishermen pioneered and hold dear. One of the great fly fishermen, the late Lee Wulff, was fond of saying that a fish is too valuable to be caught only once.

Catch and release is the law on many popular trout streams and for some species of saltwater fish. Be sure you know the law on which fish must be released and follow it completely.






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It is a good idea to wet your hands before handling a fish—even when using a net.

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When releasing a fish, try not to remove it from the water. Use needle-nosed pliers or forceps to remove the hook. If the hook is deeply imbedded in a fish's mouth, do not try to remove it. Simply cut the leader as close to the hook as possible. Trying to remove a deeply imbedded hook can cause more harm to the fish than cutting the leader close to the hook and allowing the hook to deteriorate over time.

If you do remove the fish from the water, handle it gently, with *wet hands* or a finely meshed landing net so as not to disturb the protective slime that covers its body. If taking a picture of the catch, have a friend ready with a camera to reduce the time the fish is out of the water. Support the weight of the fish while you hold it horizontally (never vertically), and return the fish to the water as quickly as possible.

Before releasing, revive a tired fish by facing it upstream in a natural position. Gently move it back and forth to move water through its gills until it swims away on its own.





# Cleaning, Filleting, and Cooking Fish

There are as many recipes for cooking a freshly caught fish as there are anglers. Proper cleaning and preparation of a fish before cooking will help ensure success with whatever cooking method you choose.

## Cleaning Fish

Follow Leave No Trace principles and local regulations for proper disposal of all fish entrails, skeletons, and other remains. In many areas, you should treat this waste as you would human waste.

**Step 1**—Cover the area with brown paper or newspaper. Keep a plastic bag handy for any waste. Make sure you have a sharp knife.

**Step 2**—Rinse the fish under clean, cool water.

**Step 3**—Skin the fish, or remove the scales using a scale remover or sharp knife. (Hold the fish by the tail and run the dull edge of your knife from tail to head until the fish feels slick.) If you skin the fish, it won't need to be scaled. To skin the fish, cut down the backside and loosen the skin around the fins. Remove the skin with pliers; pull the skin down from head to tail and cut it off at the tail.



**Step 4**—Starting at the anal opening near the tail, cut through the belly to the gills.

**Step 5**—Open the belly and remove the entrails and gills from the fish. (Don't burst the stomach.) Scrape out the kidney line (it's reddish-brown) along the backbone.

**Step 6**—If you want, remove the head by breaking the backbone against the edge of the cutting board or a table. Detach the head by cutting through the fleshy area.

**Step 7**—Remove the tail and pull off the dorsal fin (along the top of the fish) with a quick tug.

**Step 8**—Rinse the fish well under cool running water.

## Filleting Fish

Keep in mind that not all fish should be filleted. Trout, for instance, need only be cleaned. However, removing the meat of some fish from the bones and skin makes it easier to cook and to eat. Here is one way to do it.

**Step 1**—Lay the fish on its side and make a cut just behind the gills down to the backbone, but not through it.

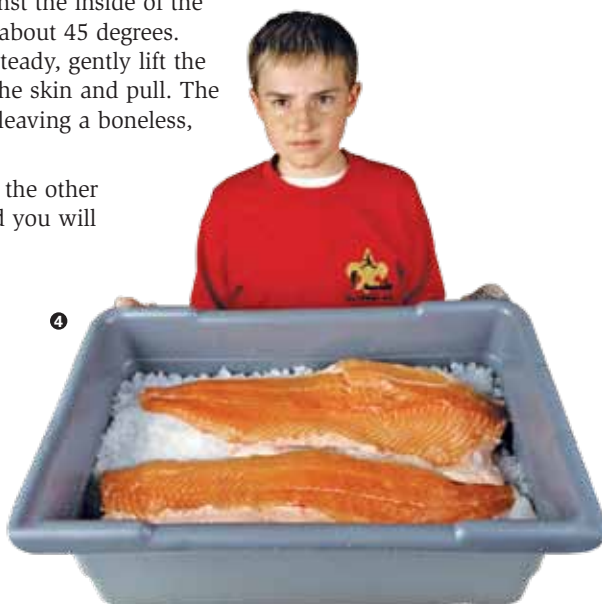


**Step 2**—Start at the cut made in step 1 and run the point of the knife alongside the backbone, down to where it starts to click along the tops of the ribs. Cut alongside the ribs, working back toward the tail until the entire side of the fish is free from the ribs and backbone, but leave it attached to the tail.



**Step 3**—Lay the side flat and hook a forefinger under the skin near the tail. Run the knife into the meat next to the skin and hold the blade against the inside of the skin at an angle of about 45 degrees. Holding the blade steady, gently lift the forefinger holding the skin and pull. The skin will slide out, leaving a boneless, skinless fillet.

**Step 4**—Repeat on the other side of the fish, and you will have two fillets.



## Cooking Fish

There are many ways to cook fish. One of the easiest and tastiest is to simply sauté the entire fish—or the fillets if the fish is larger—in some butter in a hot skillet. Keep the heat low enough that you do not burn the butter. Turn the fish after it has cooked for five minutes on a side. Serve with lemon.



Try this tasty, no-nonsense recipe next time you bag a fish on the fly. Serves four.

### Oak's Grilled Fish in Foil\*

- 1 lb. fish fillets
- $\frac{1}{4}$  teaspoon pepper
- 2 tablespoons margarine or butter
- $\frac{1}{2}$  teaspoon garlic powder
- $\frac{1}{4}$  cup lemon juice
- Pinch of paprika
- 1 tablespoon chopped parsley
- 1 medium onion, thinly sliced
- 1 teaspoon dried dill weed
- Heavy-duty aluminum foil
- 1 teaspoon salt
- Margarine or butter to grease the foil

Grease four large squares of foil with margarine. Place equal amounts of fish on each square. In a small saucepan, melt 2 tablespoons of margarine. Add the lemon juice, parsley, dill weed, salt, pepper, and garlic powder. Pour equal amounts of the mixture over the fish. Sprinkle with the paprika, and top with the onion slices. Wrap the foil securely around the fish, but leave some room for the fish to expand. Grill 5 to 7 minutes on each side or until the fish flakes with a fork. Enjoy!

\*This recipe provided courtesy of David Oakley.







# Fishing Safety

Fly-fishing is not a dangerous sport, but you should always be prepared for emergencies and know how to handle them. Be prepared to treat minor injuries by bringing along a small first-aid kit complete with bandages, antiseptic wipes, insect repellent, and sunscreen.

As in any outdoor activity, you must take precautions to prevent heat reactions and dehydration. Wear sunscreen with a sun protection factor (SPF) of at least 15 (reapply it often), drink plenty of water, and limit your physical activity in the heat of the day.



When fly-fishing, you should always wear eye protection and a broad-brimmed hat. A good pair of polarized glasses will protect your eyes and also help you spot fish.

When wading, be careful not to get in too far or too deep, and avoid strong currents. If you should lose your balance and fall, simply tread water or float as you are carried downstream. Wait until you have reached relatively quiet water, then swim to shore.

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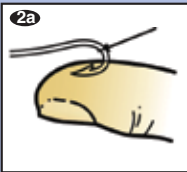
Always be aware of the path of your fishing rod and line when you cast so that the hook and line don't catch on anything—especially another angler!



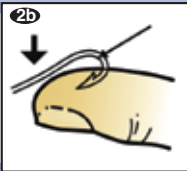
## Removing a Fishhook in the Skin

A fishhook embedded in the skin is a frequent outdoor injury. Using a barbless hook allows for easy hook removal, but if you are using a barbed hook, follow these procedures.

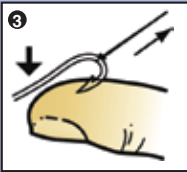
Do not try to remove a fishhook from the face or from an eye or an earlobe, and never try to remove an embedded hook by pulling it back the way it went in. Cut the fishing line and, if possible, let a doctor remove the hook from the flesh. If that isn't possible, you might have to do the job yourself. First, wash your hands with soap and warm water. Wear nonlatex disposable gloves and protective eyewear to avoid contact with blood.



**Step 1**—Wrap a 3-foot length of fishing line around the bend of the hook, and securely wrap the ends around your index or middle finger.



**Step 2**—Keep the affected body part flat and stable, then firmly push down on the shank to free the barb from the injured tissue. The shank should be parallel to the injured tissue.



**Step 3**—Keep bystanders well away from the area. While maintaining pressure on the shank, give the line a quick, sharp jerk. Be careful to avoid getting snagged by the outcoming hook.

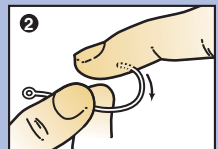
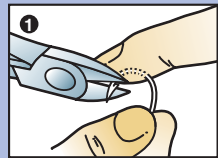
**Step 4**—Wash and bandage the injury, and keep the wound clean. Apply triple antibiotic ointment if there are no known allergies or sensitivities to the medication. See a doctor as soon as possible, because the risk of infection is high with this type of injury.

If the hook has lodged so that the barb is visible above the skin, try this method:

**Step 1**—Cut off the barbed end with wire cutters or pliers.

**Step 2**—Back the shank of the hook out through the entry wound.

Because the risk of infection is high with any type of puncture wound, be sure to see a doctor as soon as possible.



## Treating Minor Injuries

Even a gentle sport like fly-fishing can come with its perils. A good angler will be well-versed in first-aid for cuts, scratches, puncture wounds, and insect bites and stings.

Cuts and scratches are wounds—openings in the skin and tissues that can allow germs to enter the body and cause infection. Wash minor scratches and cuts with soap and water. Apply antiseptic to help prevent infection. Keep the wound clean with an adhesive bandage. On camping trips, clean and rebandage small wounds daily.

Larger cuts should be treated with direct pressure to stop bleeding, then cleaned as well as possible to limit infection. Cover an open wound with a sterile gauze pad or clean cloth that has been folded to make a pad. Hold the pad in position with tape, a cravat bandage, or other binder. Remember, anyone suffering a serious wound should be treated for shock and seen by a physician.

Puncture wounds can be caused by pins, splinters, nails, and fishhooks. All can be dangerous, because they allow germs into a wound that is hard to clean. To treat a puncture wound, encourage the wound to bleed to help flush out dirt or other particles that might have been forced inside. Use tweezers sterilized over a flame or in boiling water to pull out splinters, bits of glass, or other objects you can see. Wash the area with soap and water, apply a sterile bandage, and get the victim to a doctor.

Many spider bites can be dangerous. Victims of spider bites should be treated by a doctor as soon as possible.

The bites or stings of insects, spiders, chiggers, and ticks can be painful. Some can cause infection. Applying calamine lotion to insect bites may bring relief, but the most important thing to remember is to try not to scratch. Applying an ice pack can help reduce swelling.

For a bee or wasp sting, scrape away the stinger with the edge of a knife blade. Don't try to squeeze it out; doing so will force more venom into the skin from the sac attached to the stinger. Ice also will help ease the swelling of stings.



Never try to remove a fishhook that is lodged in the face or near an eye, artery, or other sensitive area.



If a tick has attached itself, grasp it with tweezers close to the skin and gently pull until it comes loose. Don't squeeze, twist, or jerk the tick, as doing so could leave its mouthparts in the skin. Wash the wound with soap and water and apply antiseptic. After dealing with a tick, thoroughly wash your hands and any affected area to help prevent Lyme disease, a bacterial infection that is spread through contact with infected ticks. If redness develops in the bite area, see a doctor.



## Treating Heat Reactions

When the body's cooling system gets overworked, heat exhaustion can occur. Symptoms can include pale, clammy skin; nausea and fatigue; dizziness and fainting; and headache, muscle cramps, and weakness. Treat heat exhaustion by having the victim lie in a cool, shady place with the feet raised. Remove excess clothing. Cool the victim with wet cloths applied to the body. Let an alert victim sip a little water. Recovery should be rapid, but if symptoms persist, call for medical help immediately.

Heatstroke is a reaction to heat that is more serious than heat exhaustion. It occurs when the body's cooling system shuts down completely. The victim's temperature often soars to a life-threatening level. Symptoms include very hot skin; red skin that is either dry or damp with sweat; rapid and quick pulse; noisy breathing; confusion and irritability; unconsciousness. In cases of heatstroke, call for medical help immediately. While waiting for medical help, cool the victim as soon as possible. Move the victim to a cool, shady spot and cool the person any way you can, using any of the following techniques:

- Remove outer clothing and sponge the person with cool water.
- Cover the victim with wet towels, wet clothing, or whatever else is available.
- Fan the person.
- Place the person in a cool stream or in front of a car air conditioner.

Keep the victim lying down and comfortable with head and shoulders slightly raised. Monitor the person's temperature until help arrives.

## Trip Itinerary

Always tell your parents or guardians where you are going and when you expect to return. If fishing a remote area, leave your trip plan with a resort owner or dock operator. If nothing else, write your trip plan on a piece of paper and stick it up under the windshield wiper of the car. If you run into trouble, trained searchers will know where to look.

## Sunburn

Sunburn is a common injury among people who enjoy being outdoors. Most sunburns are first-degree burns, but prolonged exposure to the sun can cause blistering—a second-degree burn.

If you or one of your companions gets sunburned, prevent further injury by getting out of the sun and into the shade. If no shade is available, have the person put on a brimmed hat, pants, and a long-sleeved shirt that will afford protection from the sun. Treat painful sunburn with damp cloths. Remedies containing aloe vera also might provide relief.

Sunburn is easy to prevent by wearing protective clothing and applying plenty of sunscreen with an SPF rating of at least 15. Reapply if you are sweating and after you have been in water.



## Treating Dehydration

Dehydration is caused by lack of water in the body. Your body must have water for digestion, respiration, brain activity, and regulation of body temperature. The first signs of dehydration are dark-colored urine, thirst, dry lips, and a slightly dry mouth. Signs of moderate dehydration include a very dry mouth, sunken eyes, and pale skin. As dehydration progresses, other signs can include fatigue, headache, body aches, a rapid but weak pulse, rapid and short breathing, cold hands and feet, and confusion. Left unchecked, severe dehydration can lead to shock and death.

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Never drink water that has not been treated. Treat it on the trail or carry fresh water from home.

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If you are mildly dehydrated, drink plenty of water to help rehydrate your body. You should see a physician if you are moderately dehydrated. However, severe dehydration requires hospitalization because you must be pumped with intravenous fluids right away.

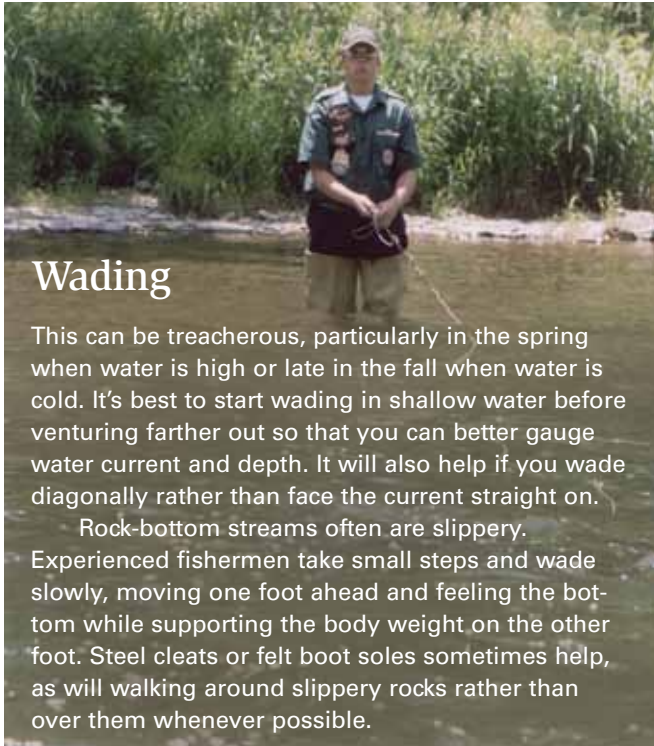
Prevent dehydration by drinking enough water to keep your urine clear; don't wait until you are thirsty. If you feel overheated, stay in the shade whenever possible. Don't overlook prevention in cold-weather conditions, too. Cold, wet conditions can mask dehydration symptoms to dangerous levels. So, in cold or hot weather conditions, it's important to stay well-hydrated.

## Treating Hypothermia

Hypothermia is the lowered internal body temperature that occurs when the body loses heat faster than it can produce it. Water or air temperature lower than 70 degrees poses hypothermia risks. Moving water and wind substantially increase the loss of body heat. Any combination of cool weather and damp clothing, wind, exhaustion, or hunger can bring hypothermia on. In fact, most cases occur when the air temperature is well above freezing.

The best way to deal with hypothermia is to prevent it in the first place. Dress appropriately for the weather; always carry rain gear to keep yourself and your clothing dry. Wearing a U.S. Coast Guard–approved personal flotation device (PFD) if there is any risk of being in cold water or being stranded in water far from shore; the PFD also can serve as insulation against the cold. Wear a hat, eat plenty of energy foods, and do not push yourself to a dangerous point of fatigue.

See the *Swimming* and *First Aid* merit badge pamphlets for more detailed information on treating heat- and cold-related illnesses.



## Wading

This can be treacherous, particularly in the spring when water is high or late in the fall when water is cold. It's best to start wading in shallow water before venturing farther out so that you can better gauge water current and depth. It will also help if you wade diagonally rather than face the current straight on.

Rock-bottom streams often are slippery. Experienced fishermen take small steps and wade slowly, moving one foot ahead and feeling the bottom while supporting the body weight on the other foot. Steel cleats or felt boot soles sometimes help, as will walking around slippery rocks rather than over them whenever possible.

## Lightning



During lightning storms, avoid the summits of mountains, crests of ridges, slopes above timberline, and large meadows. If you see a storm approaching, quickly descend to a lower elevation, away from the direction of the approaching storm. Instruct Scouts to squat down and keep their heads low. Avoid isolated trees and trees much taller than adjacent trees; and water, metal objects, and other substances that will conduct electricity over long distances.



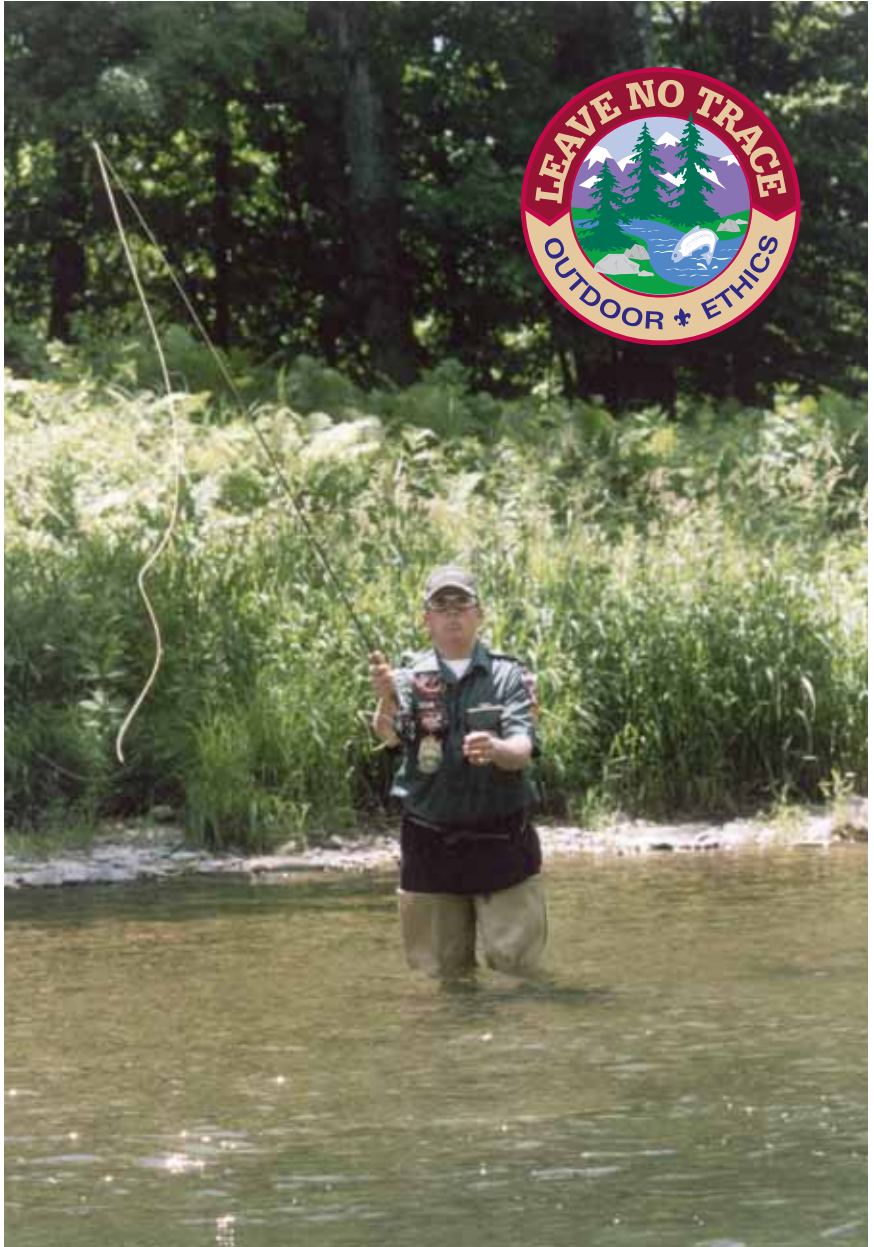
If the threat of lightning strikes is great, group members should spread out at least 100 feet apart and squat with feet close together. Remove backpacks with either external or internal metal frames. In tents, stay away from metal poles.



## Look Out for Lightning

Many fly fishermen use graphite rods—which conduct electricity—and stand in water in open areas, so lightning is a particular danger. At the first indication of an approaching thunderstorm, get out of the water and retreat quickly to a safe location.





# Fish Conservation and Ethics

Fly fishermen are among the most dedicated conservationists. They are concerned with keeping the waters where they fish clean and with returning the fish they have caught to those waters unharmed. Practice a catch-and-release ethic. Try to have as little impact as possible on the banks of the streams where you fish.

There are several fly-fishing organizations that help spread the conservation ethic by working on stream restoration, restocking, and other fish-friendly projects. Consider joining Trout Unlimited, the International Game Fish Association, or the Federation of Fly Fishers and learn what you can do to promote and preserve the sport and its values.

Fly-fishing is a more than a leisure activity; it is a heritage. When you step into a clear, cold stream where mayflies are hatching and you study the water for the rise of fish, you will feel a thrill that has been experienced by thousands of other anglers before you. Enjoy the experience to its fullest—the water, the fish, and the plant, bird, and animal life. And as you enjoy the experience, make a promise to do what you can do to pass it along.

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Practice good stream etiquette.

Do not crowd other anglers.

Make sure you have permission before you cross private land.

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# Outdoor Code

*As an American, I will do my best to —*

## **BE CLEAN IN MY OUTDOOR MANNERS.**

*I will treat the outdoors as a heritage.  
I will take care of it for myself and others.  
I will keep my trash and  
garbage out of lakes, streams,  
fields, woods, and roadways.*

## **BE CAREFUL WITH FIRE.**

*I will prevent wildfire. I will build my fires only where  
they are appropriate. When I have finished using a fire,  
I will make sure it is cold out.  
I will leave a clean fire ring, or  
remove all evidence of my fire.*

## **BE CONSIDERATE IN THE OUTDOORS.**

*I will treat public and private property with respect.  
I will use low-impact methods of hiking and camping.*

## **BE CONSERVATION-MINDED.**

*I will learn how to practice good conservation of soil,  
waters, forests, minerals, grasslands, wildlife,  
and energy. I will urge others  
to do the same.*

## The Outdoor Code and Leave No Trace

Sooner or later, all anglers discover that it is not enough to enjoy the sport of fishing and the tasty fish dinners that go with it. All fishermen find that they have a responsibility to their sport and to the environment in which the fish live.

Entire rivers and lakes have been emptied of game fish because of human-caused pollution. However, many rivers and lakes have been reclaimed once fishing enthusiasts banded together and demanded it. Boy Scouts have been active in cleaning up trash from rivers and in helping state fishery managers with the rehabilitation of streams for game fish species.

To ensure a healthy future for ourselves and our environment, we must do more than simply pick up litter. We must learn how to maintain the integrity and character of the outdoors. Leave No Trace is a set of guidelines as well as an awareness and an attitude that helps us to do just that. These guidelines apply to fishing just as well as they do to hiking, camping, or any other outdoor activity.

**Plan Ahead and Prepare.** Proper planning and preparation for a fishing trip help you to have a safe and enjoyable experience while minimizing damage to natural and cultural resources. Fishermen who plan ahead can avoid unexpected situations and minimize their impact by complying with area game and fish laws, such as size and catch limits, tackle and bait regulations, and seasonal restrictions. Failure to know and obey these laws can lead to an arrest and a stiff fine. If you need more information, ask a local game warden. Be sure to obtain a fishing license if necessary and any other needed permits or permission.

Obtain information concerning geography, water levels, and weather where you plan to fish so that you are not caught off guard by a storm or difficult terrain. Always leave a trip plan with a responsible adult or two so they will know where you are going and when you plan to return.

Allow ample time to travel to and from your desired fishing spot, whether on the water or the shore. Take along the proper equipment and tackle for the type of fishing you plan to do. It also is helpful to schedule your outing to avoid times of high use. Following these steps will ensure a safe, comfortable, and fun fishing trip.




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Using a float tube

or waders is a good way to minimize your impact.

These devices leave little or no lasting impact and allow you better access to the fish.

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Learn the Leave No Trace techniques for your specific activity or destination. Check with local land managers to be sure you are using the proper techniques.

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**Travel and Camp on Durable Surfaces.** Whether you fish for a few hours, an entire day, or plan to camp and fish, it is important to minimize your impact on the land. In high-use areas, concentrate your activity where vegetation is already absent. Use wading gear to reduce stream and lakeside impact. Use existing trails and select designated or existing fishing areas. In more remote, less-traveled areas, avoid creating new trails that cause erosion, and avoid places where impacts are just beginning to show.

If camping overnight, always camp at least 200 feet from shorelines. Keep campsites small by arranging tents in close proximity. If you are camping and cooking that day's catch, disperse tents and cooking activities—and move camp daily to avoid creating permanent-looking campsites. Always choose the most durable surfaces available: rock, gravel, sand, compacted soil, dry grasses, or snow.

It is especially important to avoid impacting stream banks and lakesides. The area that is immediately adjacent to a stream or river is called the riparian zone. These zones supply food, cover, and water for a diverse number of animals, both in and out of the water. They also serve as migration routes and forest connectors between habitats for a variety of wildlife, especially birds. In addition, riparian zones generally contain more diversity and are more productive in plant growth and animal species than land farther away from the water.

**Dispose of Waste Properly (Pack It In, Pack It Out).** This simple yet effective saying helps motivate outdoor visitors to take their trash home with them. Inspect your fishing spot, boat, or campsite for trash or spilled foods. Pack out all trash, leftover food or bait, and litter. Use designated fish cleaning areas, or check with the local game and fish officials if you will be fishing in a more remote area.

Responsibly dispose of used or broken fishing line by packing it out with the rest of the trash. Many tackle shops offer recycling bins specifically for used fishing line. Anglers should make every effort to retrieve broken line and snagged hooks. If a hook is snagged and the leader breaks, the responsible thing to do is go after that hook and line. Do not leave it there to decompose. Monofilament line can last for decades under certain conditions and can potentially harm birds and other wildlife.



You must properly dispose of any wastewater or bodily waste while in the backcountry. If cooking in the backcountry, strain food particles from your dishwater and disperse the water at least 200 feet from any springs, streams, or lakes. Use biodegradable soap 200 feet or more from any water source. Dig catholes to properly dispose of human waste and to prevent the spread of disease and exposure to others. The catholes should be 6 to 8 inches deep in humus soil and at least 200 feet from water, trails, and campsites.

## Disposal of Fish Entrails

If you decide to keep what you catch, you must dispose of the entrails properly. Tradition held that you would throw the entrails back into the water or scatter them in a large area so animals could eat them. If everyone disposed of a catch in this manner, the outdoors would quickly become unattractive to humans. In addition, attracting wildlife to areas where people camp is not a good idea.

Accepted practice today is to dispose of all fish entrails in solid waste facilities. In the backcountry, treat the entrails as you would human waste by burying them in a cathole at least 200 feet from any water source. This disposal method is especially important when you fish trout streams.

In certain states there is a growing threat to trout called whirling disease. This disease attacks the trout's central nervous system. Spread through spores inside infected fish, whirling disease is potentially deadly, especially to younger trout. When the infected fish die or the entrails are thrown into the water, the spores are transferred to a new host and the cycle starts all over again.

If fishing in an area that might be affected with whirling disease, be sure to wash and completely dry all tackle, waders, float tubes, and boats. It is always a good idea to check with local land managers for the best ways to dispose of fish entrails.

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Practice catch-and-release fishing to help ensure quality fishing for future anglers. The statement "Limit your kill; don't kill your limit" should be part of every Leave No Trace fishing experience.

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**Leave What You Find.** Allow others a sense of discovery, and preserve the past. Leave rocks, plants, animals, archaeological artifacts, and other objects as you find them. Examine but do not touch cultural or historical structures and artifacts that you may stumble across. It may be illegal to remove artifacts.

Good fishing spots are found, not made. Avoid altering a site, digging trenches, or building structures. Never hammer nails into trees, hack at trees with hatchets or saws, or damage bark and roots by tying horses to trees for extended periods. Replace surface rocks or twigs that you cleared from your fishing spot or campsite. On high-impact sites, clean the area and dismantle inappropriate user-built facilities such as log seats or tables and multiple fire rings.

To avoid spreading invasive species and disease, do not transport fish or live bait from one body of water to another or from one location to another. Be sure to always clean your gear and clothing after a fishing trip so you don't spread invasive species that might have caught a ride home.



**Minimize Campfire Impacts.** If you plan to cook what you catch while on your fishing trip, you must consider the potential for resource damage. A low-impact alternative to campfire cooking is a lightweight camp stove. Stoves are fast, eliminate the need for firewood, and make cleanup after meals easier.

If you build a fire, keep it small. Whenever possible, use an existing fire ring and dead and downed wood that can be broken easily by hand. Burn all wood to ash and remove all unburned trash and food from the fire ring. Be certain all wood and campfire debris are cold-out. Choose not to have a fire in areas where wood is scarce.



**Respect Wildlife.** Help keep wildlife wild. Be respectful of any catch-and-release areas, and return unharmed to the water any fish that exceed the designated limit. Use appropriate tackle; lead sinkers, for example, are harmful to fish and other wildlife. Nontoxic alternatives to lead sinkers, some of which have other advantages over lead, include rock, ceramics, iron, steel, and bismuth. These materials are becoming readily available and should be used as an alternative whenever possible.

Observe wildlife from afar to avoid disturbing them; you are too close if an animal alters its normal activities. Never feed wildlife. Store food securely, and keep garbage and food scraps away from animals so they will not acquire bad habits.





If you plan on keeping a fish you caught, dispatch it right away. Do not allow a caught fish to languish on a stringer while you continue to fish. The quickest and most humane way to dispatch a fish is with a sharp blow to the area right behind its head.

**Be Considerate of Other Visitors.** Thoughtful anglers respect other visitors and protect the quality of their experience. The following are a few tenets of outdoor ethics.

- Travel in small groups no larger than that prescribed by the land managers.
- Let nature's sounds prevail. Keep the noise down and leave radios, music players, and pets at home (fish can be spooked by such interruptions).
- Select fishing spots and campsites away from other groups to help preserve their solitude (and your chances of catching fish). The ethical angler will do this even if it means walking a bit further down the stream or lakeside.
- Always travel quietly to avoid disturbing other visitors. If fishing from a watercraft, take care not to disturb other anglers' efforts on the water.
- Make sure the colors of your clothing and gear blend with the environment.
- Respect private property and leave gates (open or closed) as found.





Leave No Trace might seem unimportant until you consider the combined effects of millions of outdoor visitors. With a 750 percent increase in the use of designated wilderness areas over the last 30 years, leaving no trace is everyone's responsibility. Tailor your outdoor activities to the environment where the outing will occur. Whether outdoors for sport or leisure, you are nature's guest; remember to act accordingly while there.

To learn more about Leave No Trace, consider earning the BSA's Leave No Trace Achievement Award.

## Angling Regulations

With millions of anglers fishing the nation's waterways, it is necessary for the taking of fish to be regulated so that there are enough to go around. State conservation departments seek laws that will balance fish production with the harvest. Trained conservation officers patrol the waterways to see that the laws are followed.



**Limits.** Each state puts a limit on the number of game fish of each species that may be taken by an angler at one time. Limits vary in direct proportion to the availability of the fish. More scarce species have a much lower limit. Muskellunge, for instance, in many states are limited to one a day. Panfish, which are prolific and numerous, have much higher limits or no limits at all.

**Methods.** With the change from gathering fish only for food to the concept of fishing for sport, rules of sportsmanship have been woven into regulations. In most states, game fish must be taken on hook and line and cannot be speared or netted except with a landing net. In some areas, trout may be taken only on artificial flies or on barbless hooks. Where salmon and steelhead trout migrate up streams to spawn, only single hooks may be used on lures to prevent unscrupulous fishermen from trying to snag fish with treble hooks. In many areas, only one lure or bait may be used on one line, and only one line is allowed for each angler.

**Seasons.** To protect fish while spawning, seasons are set so that game fish can lay their eggs without interference. For species such as bass, pike, and walleye, the seasons open after spawning ends in the spring. For lake trout, brook trout, and other fall-spawning species, the seasons may close in late autumn, just before spawning starts.

Failure to know and obey the fish and game laws can lead to an arrest and a fine. True sportsmen never consider breaking the rules. Many states have a TIP (Turn In Poachers) hotline telephone number that can be called to report violations. People who break the fish and game laws are thieves, stealing from other outdoors enthusiasts and demonstrating a disregard for the environment.





# Glossary

**backing.** The line attached to the reel before the fly line.

**balance.** The state in which the rod, reel, and line are correctly matched to handle a given-weight lure or bait. Balance allows an angler to deliver the lure or bait with accuracy within any desired distance.

**catch and release.** A fishing technique in which fish are caught and immediately released back into the water.

**clicker.** The mechanism on a fly reel that supplies resistance to the turning of the spool and prevents overruns. It is called clicker because of the clicking sound it makes when engaged.

**drag.** The effect created when a fly line drags a floating fly along the surface of the water. Also, the resistance provided in the line by the reel when a fish is taking the line.

**dress.** To create a fly using items such as feathers, fur, and other materials that imitate how “real” fish food looks in nature.

**dry flies.** Traditional trout flies that float. They imitate adult forms of mayflies, caddis flies, and other insects that trout and other fish feed on.

**eddy.** In moving water, the edges where one line of current meets another or where the current breaks up around a rock, creating slack water.

**edge.** An area where two dissimilar elements of a stream or lake meet, allowing fish and fish food to gather.

**ferrules.** Joints where a fly-fishing rod fit together.

**flies.** Artificial lures created from patterns that imitate natural fish food.

**graphite.** A strong substance used to manufacture fly rods.





GUIDE

**guides.** A series of metal loops positioned along the fly rod to hold the line and distribute stress evenly along the rod.

**leader.** Transparent, tapered plastic line between the fly line and the fly.

**lie.** An area of water where fish tend to wait for food to float by.

**line hand.** The hand you are not using to cast.

**matching the hatch.** The practice of using a fly that mimics the size, shape, and behavior of the prey a fish is currently feeding on.

**monofilament.** Synthetic, nylon, or other plastic line used in the manufacture of leader material.

**nymphs.** Wet flies fished beneath the surface, imitating the underwater form of aquatic insects.

**parachute cast.** A casting technique in which the angler stops the rod abruptly at the end of the power stroke, putting slack loops into the line before it lands on the water.

**pattern.** A recognized recipe or model for a tied fly made of synthetic and natural materials and imitating natural fish food.

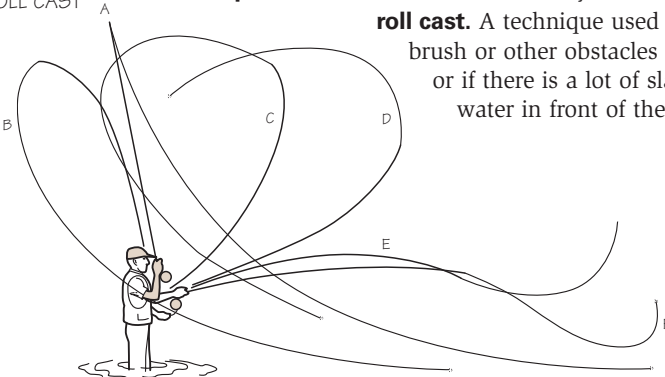
**popping bug.** A popular fly consisting of a cork or hair body, dressed around a hook to imitate a frog, wounded baitfish, or large insect. Anglers impart some action to create a popping noise on the water's surface that can arouse the curiosity of a fish and get it to strike.

**reach cast or mend.** A technique used to place line upstream when an angler must cast across current.

**recipe.** The list of materials necessary to assemble a fly.

**roll cast.** A technique used to avoid heavy brush or other obstacles behind the angler or if there is a lot of slack line on the water in front of the angler.

ROLL CAST



**shooting the line.** A casting technique in which extra line is held in the line hand and is released and pulled by the cast line to gain additional distance.

**spey casting.** Two-handed method of casting used with very long rods, usually on salmon rivers. This technique is popular in Europe and gaining popularity in the United States.

**streamers.** Artificial flies tied to look like minnows or other small fish.

**strike indicator.** Generally a bright piece of yarn or material tied to the line or leader to help anglers identify when a fish has taken the bait.

**stripping guide.** The first guide up from the reel of a fly rod, usually made from abrasion-resistant material.

**tailing fish.** A fish that feeds in water so shallow that its fins and tail sometimes show above the surface.

**tailing loop.** Term that describes what happens to the line in a poor cast. It can be caused by a number of casting mistakes that result in the fly hitting the rod or putting knots in the leader. Most tailing loops are caused by overpowering the rod.

**tapers.** Describes the shape of fly line and leader.

**tippet.** The delicate piece of leader that attaches the fly to the leader.

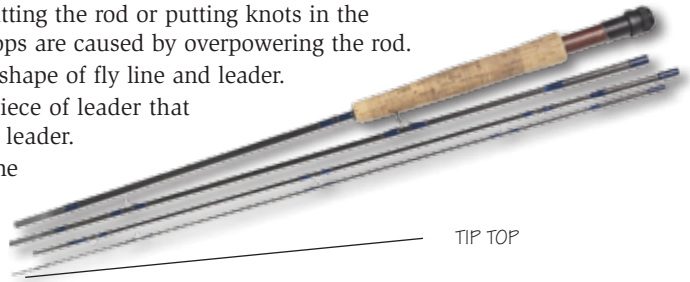
**tip top.** The guide at the very tip of the rod.

**weight-forward**

**taper.** A type of fly line that has the most weight in the front portion of the line.

**wet flies.** Term that is commonly used to describe sinking flies with wings. Nymphs also sink but are not tied with complete wings. Wet flies were among the most popular types of flies before 1900.

**wind knot.** An undesirable overhand knot in the fly leader caused either by a gust of wind that forces the leader to roll over on itself or by a bad cast.



TIP TOP

# Fly-Fishing Resources

## Scouting Resources

*Boy Scout Handbook; Conservation Handbook; Fieldbook; Deck of First Aid; Emergency First Aid pocket guide; Be Prepared First Aid Book; Freshwater Fishes pocket guide; Camping, Cooking, Fish and Wildlife Management, and Fishing merit badge pamphlets*

Visit the Boy Scouts of America's official retail Web site (with your parent's permission) at <http://www.scoutstuff.org> for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

## Books

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- Best, A. K. A. K. *Best's Fly Box*. The Lyon's Press, 1996.
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- Leave No Trace Center for Outdoor Ethics. *Fishing (Outdoor Skills and Ethics Series)*. Leave No Trace Center for Outdoor Ethics, 2004.
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- Lord, Macaulay. *The L. L. Bean Fly-Casting Handbook*. The Lyons Press, 2000.
- Martin, Darrell. *Micropatterns: Tying and Fishing the Small Fly*. The Lyons Press, 1999.
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- Rutter, Michael. *Fly Fishing Made Easy: A Manual for Beginners With Tips for the Experienced*. Globe Pequot Press, 2006.
- Shook, Michael D., and Mel Krieger. *The Complete Idiot's Guide to Fly Fishing*. Alpha Books, 2005.
- Sousa, Robert J. *Learn to Fly-Fish in 24 Hours*. McGraw-Hill, 2006.



Talleur, Dick. *Modern Fly-Tying Materials*.  
The Lyons Press, 1995.

Whitlock, Dave. *The L. L. Bean  
Fly-Fishing Handbook*.  
The Lyons Press, 2006.

Wulff, Joan. *Joan Wulff's Fly Casting  
Techniques*. The Lyons Press, 1994.

## DVDs

LaFontaine, Gary, and Dick Sharon.  
*Successful Fly Fishing Strategies*, 100  
minutes. Miracle Productions, 2002.

Wulff, Joan. *Joan Wulff's Dynamics of  
Fly Casting. From Solid Basics to  
Advanced Techniques*, 90 minutes.  
Miracle Productions, 2001.

Young, David, and Cheryl Young.  
*Fly Fishing: The Lifetime Sport*,  
240 minutes. Honeybear Press, 2005.

## Periodicals

### **Fly Fish America magazine**

Web site: <http://www.flyfishamerica.com>

### **Fly Fishing and Fly Tying magazine**

Web site:  
<http://www.flyfishing-and-flytying.co.uk>

### **Fly Fisherman magazine online**

Web site: <http://www.flyfisherman.com>

## Organizations and Web Sites

### **American Fisheries Society**

Telephone: 301-897-8616  
Web site: <http://www.fisheries.org>

### **The American Museum of Fly Fishing**

4104 Main St.  
Manchester, VT 05254  
Telephone: 802-362-3300  
Web site: <http://www.amff.com>

### **Federation of Fly Fishers**

Telephone: 406-222-9369  
Web site: <http://www.fedflyfishers.org>

### **FlyFish.com**

Web site: <http://www.flyfish.com>

### **International Game Fish Association**

Telephone: 954-927-2628  
Web site: <http://www.igfa.org>

### **Leave No Trace Center for Outdoor Ethics**

P.O. Box 997  
Boulder, CO 80306  
Toll-free telephone: 800-332-4100  
Web site: <http://www.lnt.org>

### **Trout Unlimited**

1300 N. 17th St., Suite 500  
Arlington, VA 22209  
Toll-free telephone: 800-834-2419  
Web site: <http://www.tu.org>

The Federation of Fly Fishers, International Game Fish Association, and Trout Unlimited have each signed a memorandum of mutual support with the Boy Scouts of America that emphasizes an ongoing relationship to promote mutually beneficial programs such as the Fly-Fishing merit badge.

### **U.S. Fish and Wildlife Service**

Main Interior  
1849 C St., NW  
Washington, DC 20240  
Toll-free telephone: 800-344-9453  
Web site: <http://www.fws.gov>

## Acknowledgments

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## Photo and Illustration Credits

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International Game and Fish Association (artist: Duane Raver)—cover (*striped bass*); pages 55–57 (*all illustrations*) and 59

Jupiter.com—pages 26 (*hat, sunglasses*), 27 (*duct tape, nail clippers*), 57 (*bottom*), 68 (*three bottom*), and 69 (*lemons, onion*)

Photos.com—cover (*vest, rod and reel*); pages 12, 25 (*all*), 49, 61, 69 (*salt and pepper shakers*), 79 (*lightning*), 89 (*top*), 90, and 93

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Brian Payne—pages 27 (*bottom right*), 66–67 (*all*), 71, and 87

Randy Piland—pages 64 and 68 (*top*)

Scott Stenjem—page 51

## MERIT BADGE LIBRARY

Though intended as an aid to Boy Scouts, Varsity Scouts, and qualified Venturers in meeting merit badge requirements, these pamphlets are of general interest and are made available by many schools and public libraries. The latest revision date of each pamphlet might not correspond with the copyright date shown below, because this list is corrected only once a year, in January. Any number of merit badge pamphlets may be revised throughout the year; others are simply reprinted until a revision becomes necessary.

If a Scout has already started working on a merit badge when a new edition for that pamphlet is introduced, *he may continue to use the same merit badge pamphlet to earn the badge and fulfill the requirements therein.* In other words, the Scout need not start all over again with the new pamphlet and possibly revised requirements.

Merit Badge Pamphlet	Year	Merit Badge Pamphlet	Year	Merit Badge Pamphlet	Year
American Business	2002	Engineering	2008	Photography	2005
American Cultures	2005	Entrepreneurship	2006	Pioneering	2006
American Heritage	2005	Environmental Science	2006	Plant Science	2005
American Labor	2006	Family Life	2005	Plumbing	2004
Animal Science	2006	Farm Mechanics	2008	Pottery	2008
Archaeology	2006	Fingerprinting	2003	Public Health	2005
Archery	2004	Fire Safety	2004	Public Speaking	2002
Architecture	2008	First Aid	2007	Pulp and Paper	2006
Art	2006	Fish and Wildlife		Radio	2008
Astronomy	2004	Management	2004	Railroading	2003
Athletics	2006	Fishing	2009	Reading	2003
Automotive Maintenance	2008	Fly-Fishing	2009	Reptile and	
Aviation	2006	Forestry	2005	Amphibian Study	2005
Backpacking	2007	Gardening	2002	Rifle Shooting	2001
Basketry	2003	Genealogy	2005	Rowing	2006
Bird Study	2005	Geology	2005	Safety	2006
Bugling (see Music)		Golf	2002	Salesmanship	2003
Camping	2005	Graphic Arts	2006	Scholarship	2004
Canoeing	2004	Hiking	2007	Scuba Diving	2009
Chemistry	2004	Home Repairs	2009	Sculpture	2007
Cinematography	2008	Horsemanship	2003	Shotgun Shooting	2005
Citizenship in the		Indian Lore	2008	Skating	2005
Community	2005	Insect Study	2008	Small-Boat Sailing	2004
Citizenship in the Nation	2005	Journalism	2006	Snow Sports	2007
Citizenship in the World	2005	Landscape Architecture	2008	Soil and Water	
Climbing	2006	Law	2003	Conservation	2004
Coin Collecting	2008	Leatherwork	2002	Space Exploration	2004
Collections	2008	Lifesaving	2008	Sports	2006
Communication	2009	Mammal Study	2003	Stamp Collecting	2007
Composite Materials	2006	Medicine	2009	Surveying	2004
Computers	2009	Metalwork	2007	Swimming	2008
Cooking	2007	Model Design and Building	2003	Textile	2003
Crime Prevention	2005	Motorboating	2008	Theater	2005
Cycling	2003	Music and Bugling	2003	Traffic Safety	2006
Dentistry	2006	Nature	2003	Truck Transportation	2005
Disabilities Awareness	2005	Nuclear Science	2004	Veterinary Medicine	2005
Dog Care	2003	Oceanography	2009	Water Sports	2007
Drafting	2008	Orienteering	2003	Weather	2006
Electricity	2004	Painting	2008	Whitewater	2005
Electronics	2004	Personal Fitness	2006	Wilderness Survival	2007
Emergency Preparedness	2008	Personal Management	2003	Wood Carving	2006
Energy	2005	Pets	2003	Woodwork	2003

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