

APPENDIX 1

KNOTS

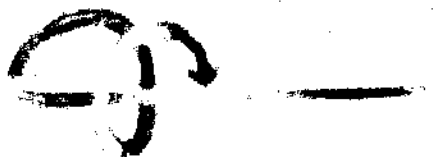
The Clinch Knot



1. Bring the free end of the line up through the eye of the hook. Give yourself about a foot of free line on top to work with.



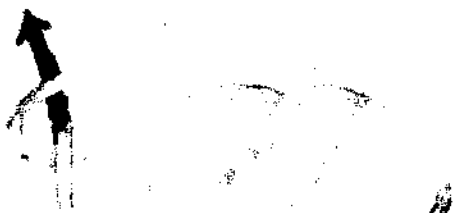
2. Take the free end back, behind and under the straight line.



3. Bring the free end back over the top full loop. Keep loops fairly loose at this point.

4. Continue looping the free end around straight line in the same direction.

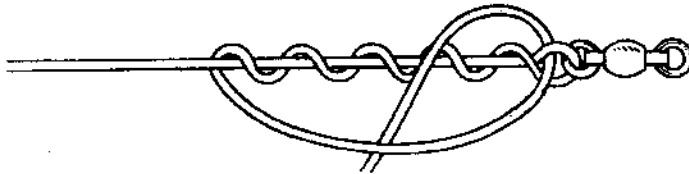
Form about four loops.



5. With the free end coming from the turn, pass it between the eye and the first loop.

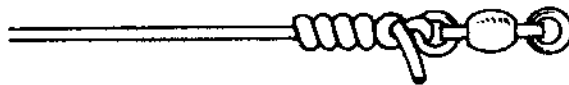
6. Slowly pull out all slack. Then pull tightly and trim off the end.

Knot Tying - The Improved Clinch Knot



1. An old standby for fishermen. Pass the line through the eye of hook, swivel or lure. Double back and make 5 turns around the standing line.

Hold the coils in place; thread end of line through the first loop above the eye, then through the big loop as shown.



2. Hold the tag end and standing line while coils are pulled up. Take care that coils are in spiral, not lapping over each other. Slide tight against the eye. Clip tag end.

Trilene® Knot

The Trilene Knot is a strong, reliable connection that resists slippage and premature failures. This knot can be used in joining line to swivels, snaps, hooks and artificial lures. The knot's unique double wrap design and ease of tying consistently yields a strong, dependable connection.



1. Run end of line through eye of hook or lure and double back through the eye a second time.

2. Loop around standing part of line 5 or 6 times. Thread tag end back between the eye and the coils as shown.

3. Tighten knot with a steady, even motion without hesitation. Trim tag end leaving about 1/4".

Palomar Knot

The Palomar Knot is a general-purpose connection used in joining fishing line to swivels, snaps, hooks and artificial lures. The double wrap of line through the eyelet provides a protective cushion for added knot strength.



1. Double the line and form a loop three to four inches long. Pass the end of the loop through hook's eye.

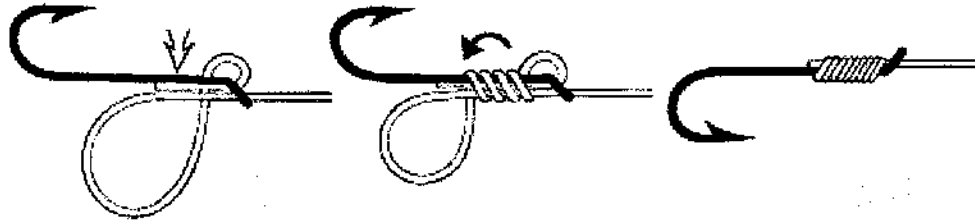
2. Holding standing line between thumb and finger, grasp loop with free hand and form a simple over-hand knot.

3. Pass hook through loop and draw line while guiding loop over top of eyelet.

4. Pull tag end of line to tighten knot snugly and trim tag end to about 1/4".

Snell Knot

The Snell Knot provides a strong connection when fishing with bait and using a separate length of leader. You can only use a snell with a leader.



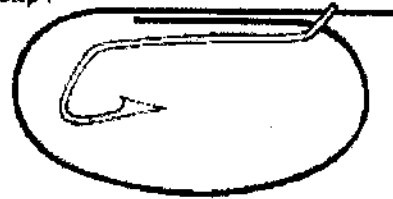
1. Insert one end of the leader through the hook's eye extending one to two inches past the eye. Insert the other end of the leader through the eye in the opposite direction pointing toward the barb of hook. Hold the hook and leader ends between thumb and forefinger of your left hand. Leader will hang below the hook in a large loop.

2. Take the part of this loop that is closest to the eye and wrap it over the hook and shank and both ends of the leader toward the hook's barb. Wrap for 7 or 8 turns and hold wraps with left hand. Grip the end of leader that is through the eyelet with your right hand and pull it slowly and steadily. Hold the turns with your left hand or the knot will unravel.

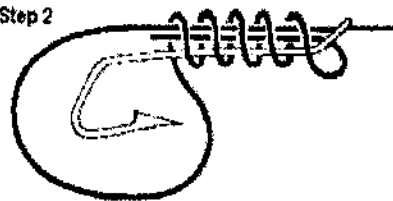
3. When the knot is almost tight, slide it up against the eye of the hook. Grip the short end lying along the shank of the hook with a pair of pliers. Pull this end and the standing line at the same time to completely tighten the knot. Trim the tag end.

1. Pass the end of the line, trace or tippet through the eye twice, leaving a loop hanging below the hook.
2. Hold both lines along the shank of the hook.
3. Use the loop to wind tight coils around the shank and both lines, from the eye upwards. Use from 5 to 10 turns.
4. Use the fingers to hold these tight coils in place. Pull the line (extending from the eye) until the whole loop has passed under these tight coils.
5. With coils drawn up, use pliers to pull up the end of the line.

Step 1



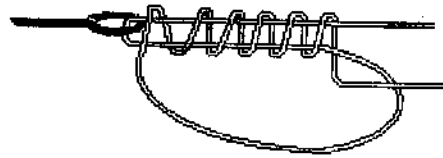
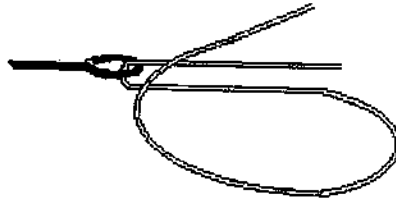
Step 2



The Uni-Knot

1. Run line through eye of hook, swivel or lure at least six inches and fold to make two parallel lines. Bring end of line back in a circle toward hook or lure.

2. Make six turns with tag end around the double line and through the circle. Hold double line at point where it passes through eye and pull tag end to snug up turns.



3. Now pull standing line to slide knot up against eye.

4. Continue pulling until knot is tight. Trim tag end flush with closest coil of knot. Uni-Knot will not slip.



Specialist Fly Knot

The Specialist fly knot is used to attach the fly to leader.



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

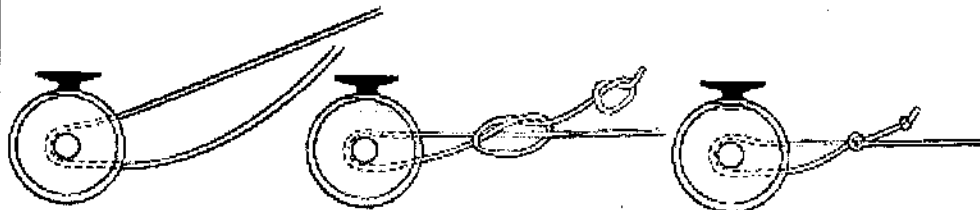
2. Make an oval loop and hold each end while wrapping the leader around the loop center 3 or 4 times.

3. Stick end of leader through loop closest to fly and cinch knot snug.

4. Trim tag end and then place the fly through the loop and pull snug.

Arbor Knot

The Arbor Knot provides the angler with a quick, easy connection for attaching line to the reel spool.



1. Pass line around reel arbor.

2. Tie an overhand knot around the standing line. Then tie a second overhand knot in the tag end.

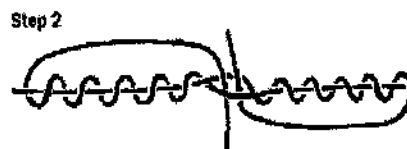
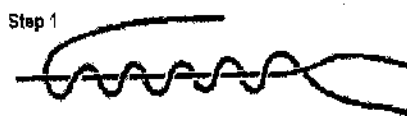
3. Pull tight and snip off excess. Snug down first overhand knot on the reel arbor.

There are two top grade knots used to join one line to another, where these are approximately of same thickness. These are the Blood Knot and the Hangman's Knot - also called the Uni Knot by International Game Fish Association.

Where the diameters are very dissimilar, either the Surgeon's Knot should be used, or the thinner line should be doubled where the knot is formed.

Blood Knot

1. Lie the ends of the two lines against each other, overlapping about 15cm.
2. Take 5 turns around one line with the end of the other, and bring the end back where it's held between the two lines.
3. Repeat by taking 5 turns around the other line, bringing the end back between the two lines. These two ends should then project in opposite directions.
4. Work the knot up into loops, taking care that the two ends do not slip out of position.
5. Draw the knot up tightly.



Albright Knot

The Albright Knot is most commonly used for joining monofilament lines of unequal diameters, for creating shock leaders and when Bimini Twist is tied in the end of lighter casting line. It is also used for connecting monofilament to wire.



2. Slip tag end of lighter line under your left thumb and pinch it tightly against the heavier strands of the loop. Wrap the first turn of the lighter line over itself and continue wrapping toward the round end of loop. Take at least 12 turns with the lighter line around all three strands.



3. Insert tag end of the lighter line through end of loop from the bottom. It must enter and leave the loop on same side.



4. With the thumb and forefinger of left hand, slide the coils of lighter line towards end of loop, stop 1/8" from end of loop. Using pliers, pull tag end of lighter line tight to keep coils from slipping off loop.



1. Bend a loop in the tag end of the heavier line and hold between thumb and forefinger of left hand. Insert the tag end of the lighter line through loop from the top.

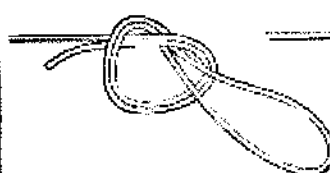
5. With your left hand still holding the heavier line pull on the standing part of the lighter line. Pull the tag end of the lighter line and the standing part a second time. Pull the standing part of the heavy mono and the light line.



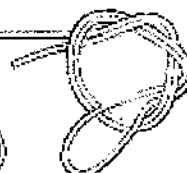
6. Trim both tag ends.

Double Surgeon's Loop

The Double Surgeon's Loop is a quick, easy way to tie a loop in the end of a leader. It is often used as part of a leader system because it is relatively strong.



1. Double the tag end of the line. Make a single overhand knot in the double line.



2. Hold the tag end and standing part of the line in your left hand and bring the loop around and insert through the overhand knot.



3. Hold the loop in your right hand. Hold the tag end and standing line in your left hand.



4. Moisten the knot in water and pull to tighten. Trim tag end to about 1/8".

Fishhook Removal

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Fishing is a common recreational sport. While serious injuries are uncommon, penetrating tissue trauma involving fishhooks frequently occurs. Most of these injuries are minor and can be treated in the office without difficulty. All fishhook injuries require careful evaluation of surrounding tissue before attempting removal. Ocular involvement should prompt immediate referral to an ophthalmologist. The four most common techniques of fishhook removal and injury management are described in this article. The choice of the method for fishhook removal depends on the type of fishhook embedded, the location of the injury and the depth of tissue penetration. Occasionally, more than one removal technique may be required for removal of the fishhook. The retrograde technique is the simplest but least successful removal method, while the traditional advance and cut method is most effective for removing fishhooks that are embedded close to the skin surface. The advance and cut technique is almost always successful, even for removal of large fishhooks. The string-yank method can be used in the field and can often be performed without anesthesia. Wound care following successful removal involves extraction of foreign bodies from the wound and the application of a simple dressing. Prophylactic antibiotics are generally not indicated. Tetanus status should be assessed and toxoid administered if needed. (*Am Fam Physician* 2001;63:2231-6.)

This article is one in a series of "Office Procedures" articles coordinated by Thomas J. Zuber, M.D., Assistant Professor, Department of Family and Community Medicine, Emory University School of Medicine, Atlanta.

Angling is a popular sport worldwide, and fishhook injuries are common in recreational and commercial fishing settings. Persons with fishhook injuries may not present to the office or emergency department because removal of embedded fishhooks can usually be accomplished in the field. However, some embedded fishhooks cannot be removed in this manner and require evaluation of the injury and exploration of the wound for the presence of a foreign body. Four techniques

for removing embedded fishhooks are described in this article.

Patient Evaluation

Most fishhook injuries are penetrating soft tissue injuries to the hand, face, head or upper extremity but can involve any body part. These injuries usually do not involve deeper tissue structures because of the linear forces applied along the fishing line to the fishhook that drive the point parallel to the skin and keep it from deep penetration.

Many different types and sizes of fishhooks are available (Figure 1). When examining the hook, it is important to note if the fishhook is single, multiple or treble, whether the hook is barbed, and the number and location of the barbs—these details will help determine the best removal technique. Often, persons will know the type of hook they were using and may be able to provide a sample for inspection.

Occasionally, more serious tissue trauma occurs from fishhook injury. While not routinely performed, radiographs may aid in determining the type of fishhook and the depth of penetration in difficult cases.¹ Neurologic and vascular status, proximal and dis-

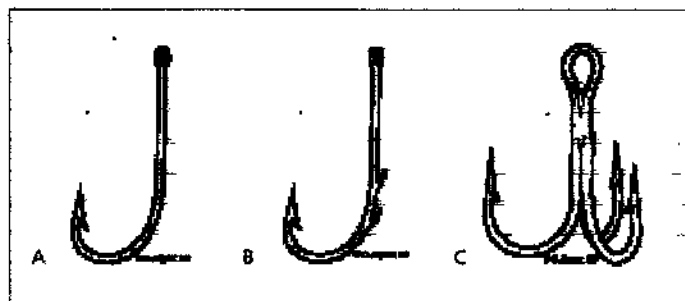


FIGURE 1. Types of fishhooks. (A) Simple-single barbed fishhook. (B) Multiple-barbed fishhook. (C) Treble fishhook.

In attempting to remove an embedded fishhook, the retrograde and string-yank methods are generally the initial procedures of choice because these methods result in the least amount of tissue trauma.

tal to the wound, should be assessed. Any fishhook injury that may involve deeper structures such as bone, tendons, vessels or nerves requires careful evaluation before attempting removal.

Cases of penetrating eye trauma secondary to fishhook injury have been reported in the literature.²⁻⁵ One such injury even included intracranial trauma.³ Fishhooks that penetrate the orbital area or are embedded in a location in which removal may injure the eye should be covered with a metal patch or cup and the patient should be sent immediately for ophthalmologic consultation.⁶ Permanent vision damage may occur with removal of the fishhook although minimal vision deficit was evident on initial presentation.

Principles of Removal

Four primary techniques have been described for the removal of fishhooks: retrograde, string-yank, needle cover, and advance and cut. Each method and some modifications to these techniques are described in detail in this article. The method selected to remove an

embedded fishhook is usually based on the judgment of the physician, the anatomic location of the injury and the type of fishhook.

Most embedded fishhooks can be removed with minimal surgical intervention. Generally, the retrograde and string-yank methods should be the first techniques attempted because they result in the least amount of tissue trauma. The more invasive procedures, such as the needle cover and advance and cut techniques, are reserved for more difficult fishhook removal.⁷ Sometimes multiple techniques must be attempted before the fishhook is successfully removed.

Most removal methods require the administration of a local anesthetic or a nerve block. Superficially embedded hooks may not require anesthesia if they can be backed out or removed easily by the string-yank method.

Local care typically involves cleaning the site with povidone-iodine or hexachlorophene solution before attempting removal of the fishhook. Saline irrigation may be required. Fishhooks with more than one point (i.e., treble fishhooks) should have the uninvolved points taped or cut to avoid imbedding these during the removal procedure. A local anesthesia should be administered before attempting removal of any barbed fishhook. All items attached to the hook (i.e., fish line, bait and the body of the lure itself) should be removed. The physician and bystanders should take care not to be struck by the hook on removal. Eye protection should be worn, especially when performing the string-yank method.

Retrograde Technique

Retrograde technique is the simplest of the removal techniques but has the lowest success rate. It works well for barbless and superficially embedded hooks. Downward pressure is applied to the shank of the hook. This maneuver helps rotate the hook deeper and disengage the barb, if present, from the tissue. The hook can then be backed out of the skin along the path of entry (Figure 2). Any resis-

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tance or catching of the barb during the procedure should alert the physician to stop and consider other removal methods.

String-Yank Technique

The string-yank technique is a highly effective modification of the retrograde technique and is also referred to as the "stream" technique. It is commonly performed in the field and is believed to be the least traumatic because it creates no new wounds and rarely requires anesthesia.⁸ It may be used to remove any size fishhook but generally works best when removing fishhooks of small and medium size. This technique also works well for deeply embedded fishhooks, but cannot be performed on parts of the body that are not fixed (e.g., earlobe).⁹ Physicians should be familiar with the concepts of this method because improper technique could cause further tissue damage.

A string, such as fishing line, umbilical tape or silk suture, should be wrapped around the midpoint of the bend in the fishhook with the free ends of the string held tightly (Figure 3). A better grip on the string can be achieved by wrapping the ends around a tongue depressor.¹ The involved skin area should be well stabilized against a flat surface as the shank of the fishhook is depressed against the skin. Continue to depress the eye and/or distal portion of the shank of the hook, taking care to keep the shank parallel to the underlying skin. A firm, quick jerk is then applied parallel to the shank while continuing to exert pressure on the eye of the fishhook. The fishhook may come out with significant velocity so the physician and bystanders should remain out of the line of flight. A commercial fishhook removal device, based on this technique, is available. (Minto Research and Development Inc., Redding, Calif.)¹⁰

Needle Cover Technique

The needle cover technique requires dexterity on the part of the physician. It works well for the removal of large hooks with single barbs but is most effective when the point of the fishhook is superficially embedded

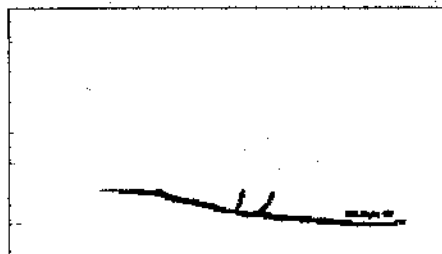


FIGURE 2. Retrograde technique. Downward pressure is applied to the shank of the fishhook while it is backed out along the point of entry.

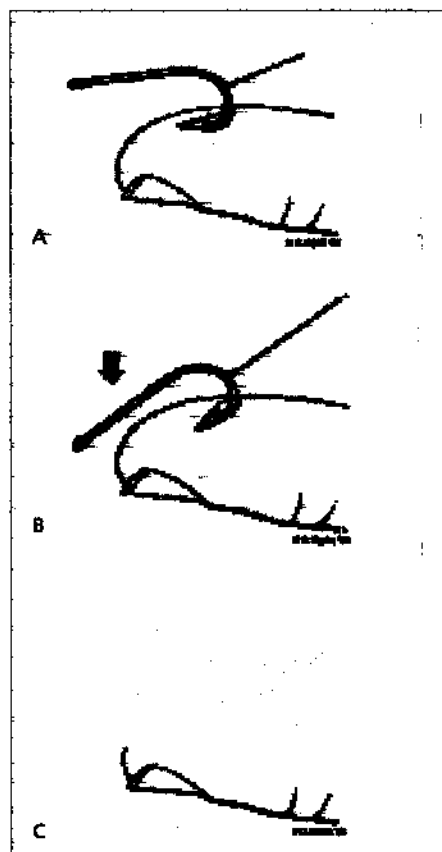


FIGURE 3. String-yank method. (A) Wrap a string around the midpoint of the bend in the fishhook. (B) Depress the shank of the fishhook against the skin. (C) Firmly and quickly pull on the string while continuing to apply pressure to the shank.

The physician should always use protective eye wear when removing embedded fishhooks, especially when using the string-yank method.

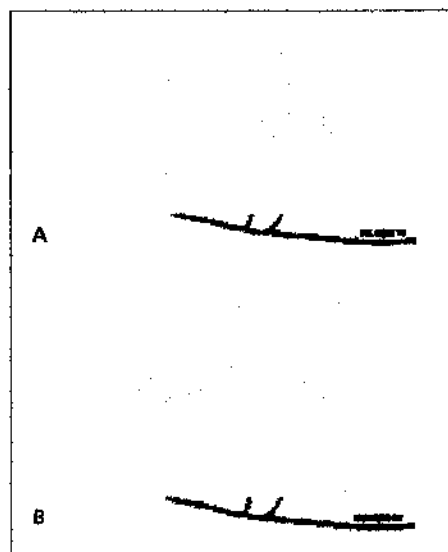


FIGURE 4. Needle cover method. (A) Advance an 18-gauge or larger-gauge needle along the fishhook until the needle opening covers the point. (B) The fishhook and needle are then removed at the same time.

and can be easily covered by the needle. After skin preparation and administration of local anesthesia, an 18-gauge or larger needle is advanced along the entrance wound of the fishhook (Figure 4). The direction of insertion should be parallel to the shank. The bevel should point toward the inside of the curve of the fishhook, enabling the needle opening to engage the barb. It is important to have the bevel pointed in the correct direction so that the longer edge of the needle matches the angle of the fishhook point. The physician should advance the fishhook to disengage the barb, then pull and twist it so

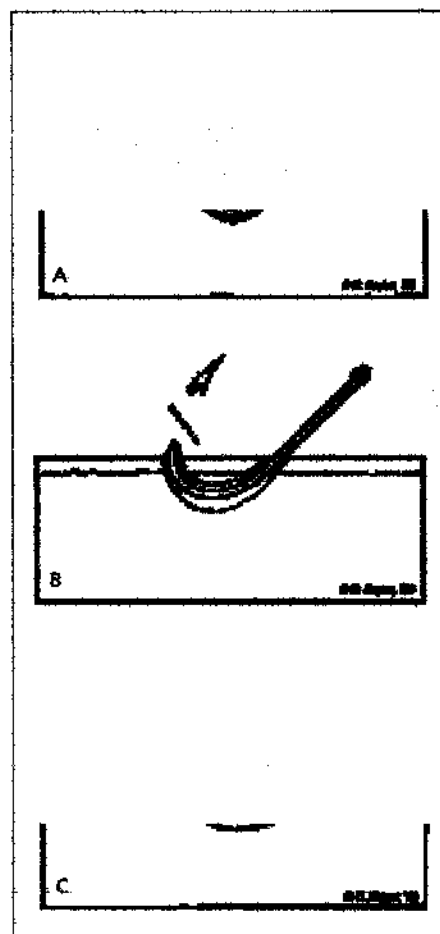


FIGURE 5. Advance and cut method: single-barbed fishhook. (A) The fishhook is advanced through the skin. (B) The barb is then cut off and (C) the remaining hook is backed out through the entry wound.

that the point enters the lumen of the needle. The physician can then back out the fishhook (the same way as in the retrograde technique), taking care to move the needle along the track with the fishhook.

A modification of this technique involves sliding a no. 11 scalpel blade along the wound to the point of the fishhook. The fishhook may then be backed out because the incision

allows room for the point. This modification may also be used in combination with the needle cover technique for more difficult fishhook injuries.

Advance and Cut Technique

One advantage of this traditional method of fishhook removal is that it is almost always successful, even when removing larger fishhooks; however, additional trauma to the surrounding tissue is a disadvantage. The advance and cut technique is most effective when the point of the fishhook is located near the surface of the skin.⁹ It involves two methods of removal: one for single-point fishhooks (Figure 5) and one for multiple-barbed fishhooks (Figure 6). Infiltration with a local anesthetic is performed over the area where the fishhook has penetrated the skin. Using pliers or needle drivers, the point of the fishhook (including the entire barb) is advanced through the skin. The point is then cut free with the pliers or another cutting tool, allowing the rest of the fishhook to be backed out with little resistance.

For multiple-barbed fishhooks, the area should be anesthetized and the fishhook advanced. Instead of removing the point, the eye of the fishhook is removed. The physician can then continue to pull the fishhook in the same direction as the point was advanced.

Post-Removal Wound Care

After removal of the fishhook, the wound should be explored for possible foreign bodies (e.g., bait). It is usually sufficient to leave the wound open, then apply an antibiotic ointment and a simple dressing. Tetanus toxoid should be administered to persons for whom more than five years has elapsed since their last tetanus booster. Well-conducted, controlled studies do not exist that support the need for systemic antibiotics in these cases; they are generally not indicated.⁷ Prophylactic antibiotic therapy may be considered for persons who are immunosuppressed or have poor wound healing (e.g., patients with dia-

Although it may produce additional tissue trauma, the major advantage of the advance and cut technique when removing an embedded fishhook is that it is almost always successful.

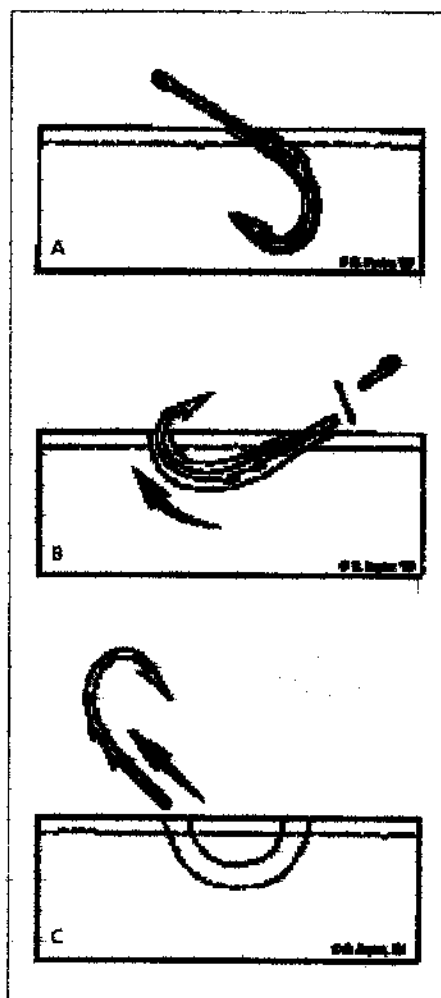


FIGURE 6. Advance and cut method: multiple-barbed fishhook. (A) The fishhook is advanced through the skin. (B) The eye of the fishhook is then cut off and (C) the remaining portion of the fishhook is pulled through the exit wound created by advancing the point.

betes mellitus or peripheral vascular disease). Prophylactic antibiotic therapy may also be considered for deeper wounds that involve the tendons, cartilage or bone. Follow-up care should be performed to ensure adequate healing and the absence of infection.

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APPENDIX 2c.

EA Code GA 1/23/04 11:42 AM Page 1



I'm an Ethical Angler. I:

avoid spilling and never dump gasoline, oil or other pollutants — on land or in the water.

never leave trash behind, including worn line, old hooks and bait, and practice recycling.

gain knowledge about Aquatic Nuisance Species and how to help prevent their spread.

learn and abide by all fishing regulations and boating laws.

educate fellow anglers and especially new participants about fishing ethics.

respect private property and the rights of other anglers and outdoor recreationists.

save fish for tomorrow by practicing conservation and learning proper catch-and-release techniques.



National Marine Fisheries Service



BoatU.S.

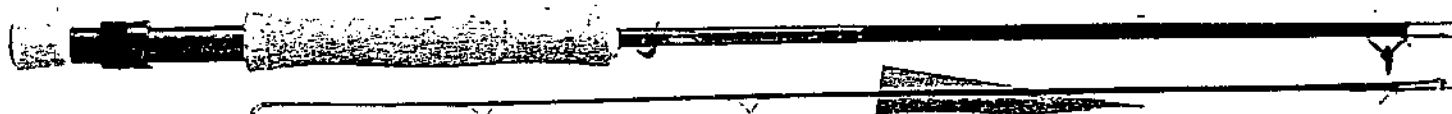
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Partners in Marine Conservation

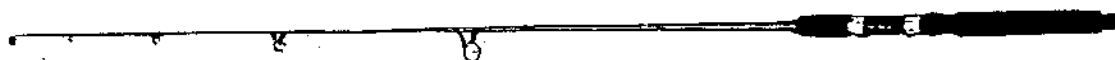
APPENDIX 4.

RODS

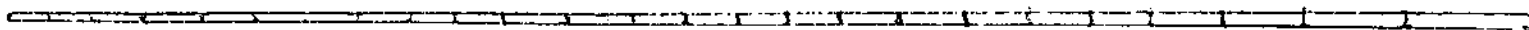
HOOK KEEPER



FLY

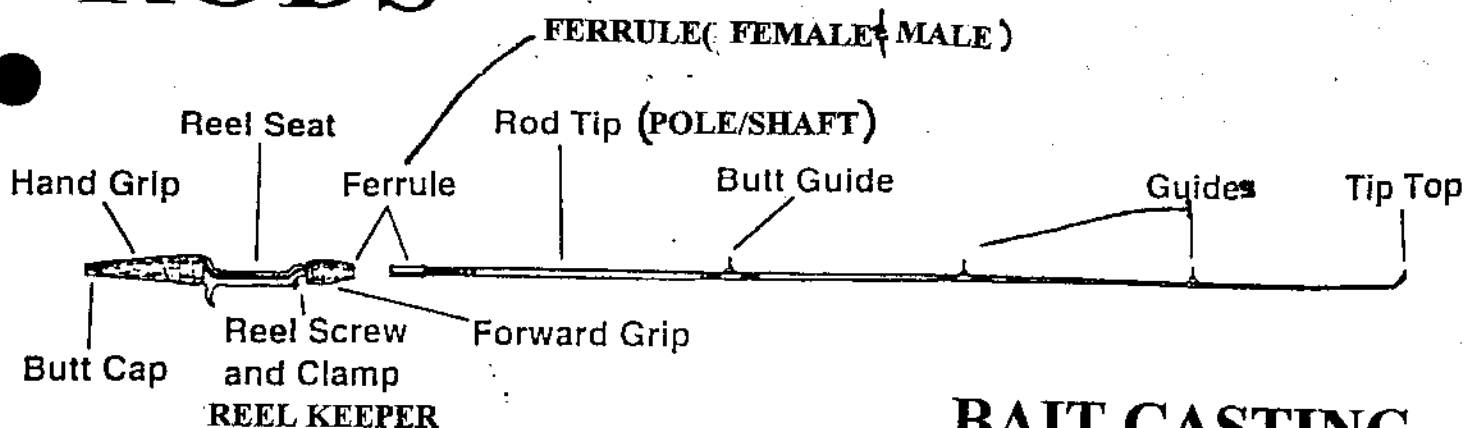


SPINNING



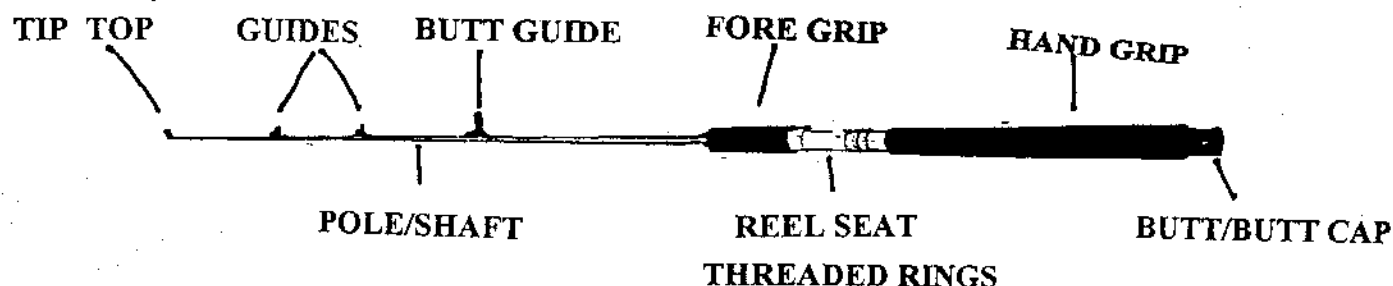
CANE

RODS



BAIT CASTING

GUIDE TYPES



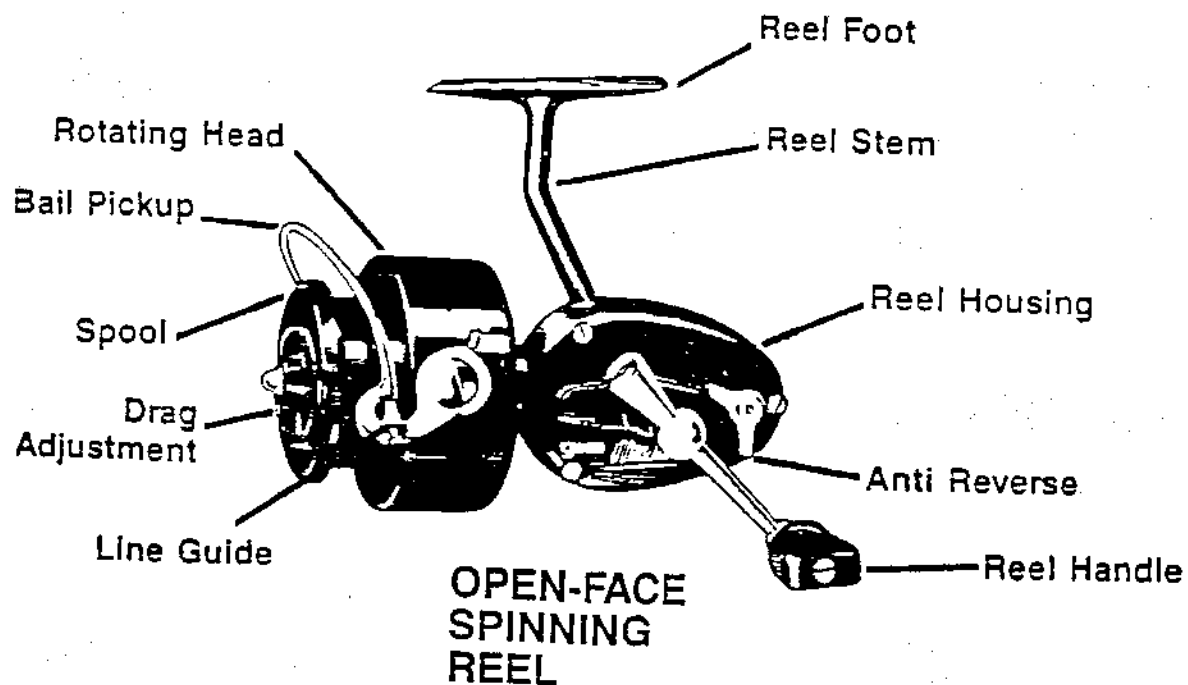
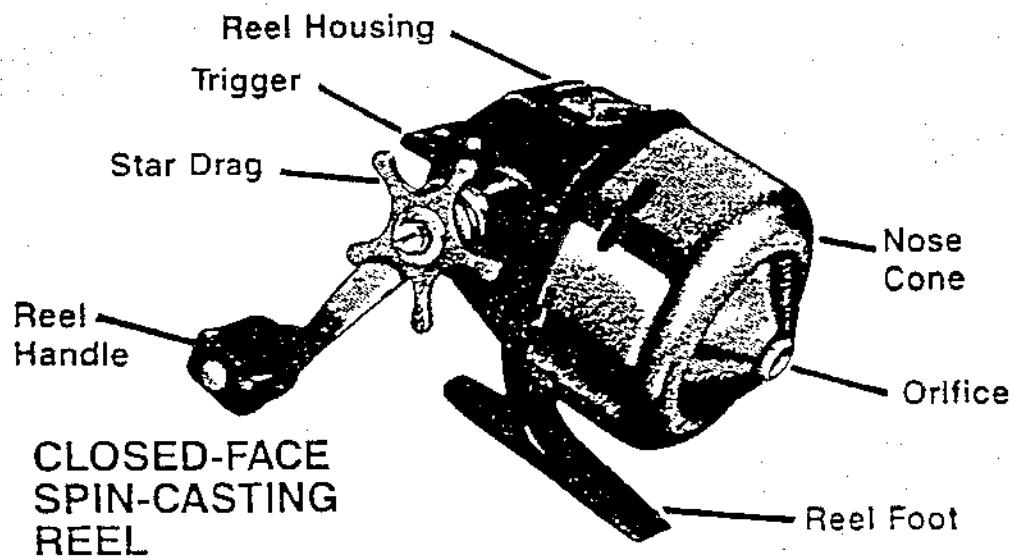
SALT WATER

REEL KEEPER TYPES

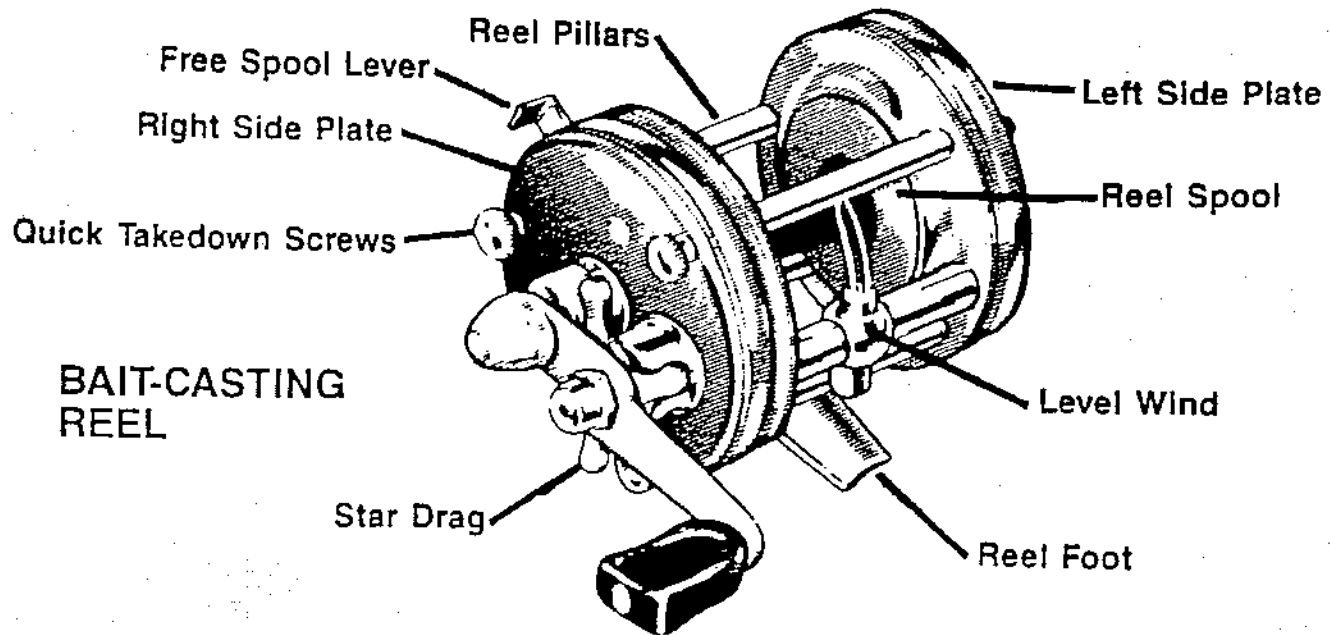
BUTT NUT AND POST (REEL SCREW & CLAMP)
THREADED RINGS

APPENDIX 5.

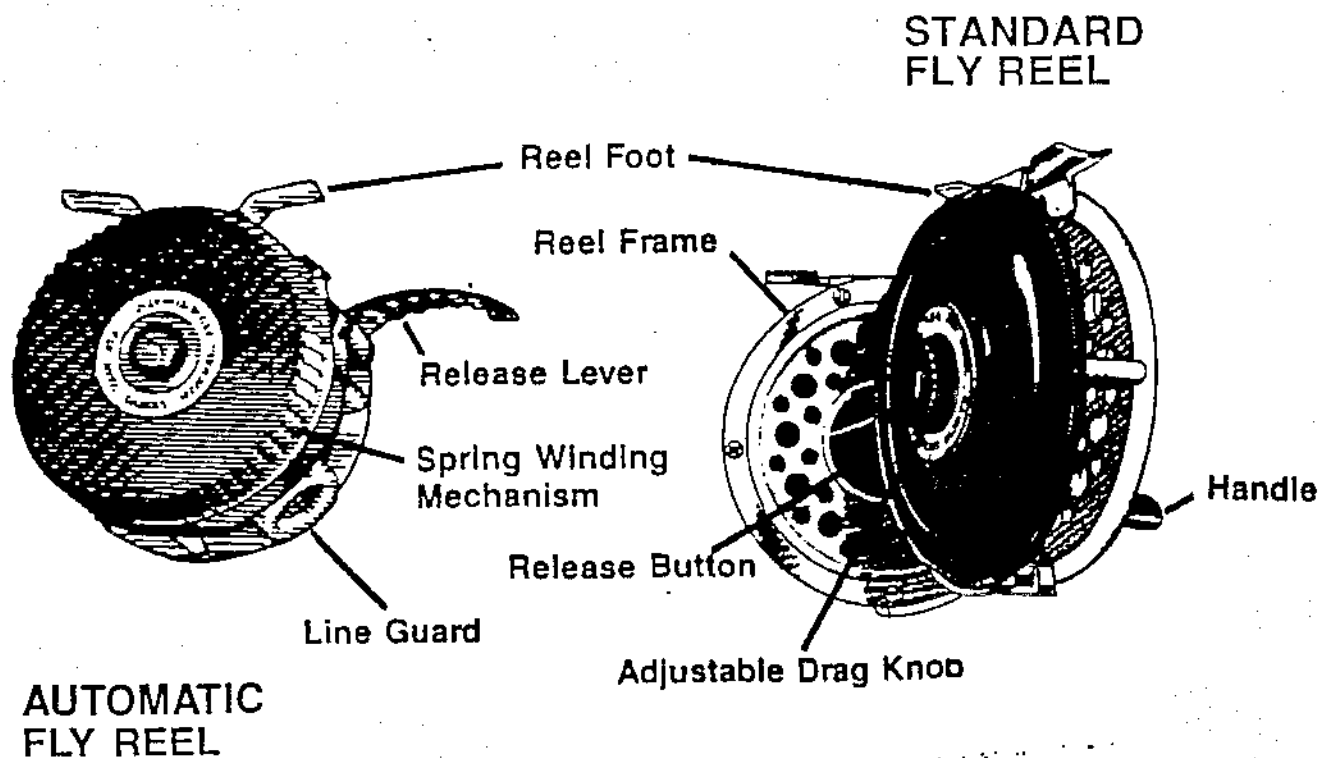
REELS



REELS



Bait-Casting and Spin-Casting



LIVE BAIT

APPENDIX 6.

WORMS GRASSHOPPERS FROGS

CRICKETS CORN FISH EGGS

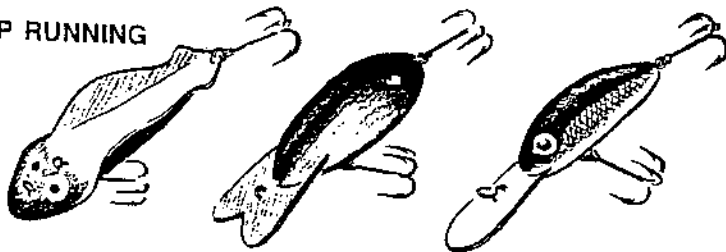
MARSHMELLOWS MINNOWS

MICE DUCKLINGS

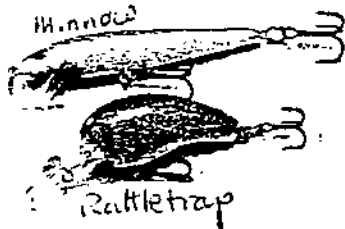
ARTIFICIAL BAIT

PLUGS

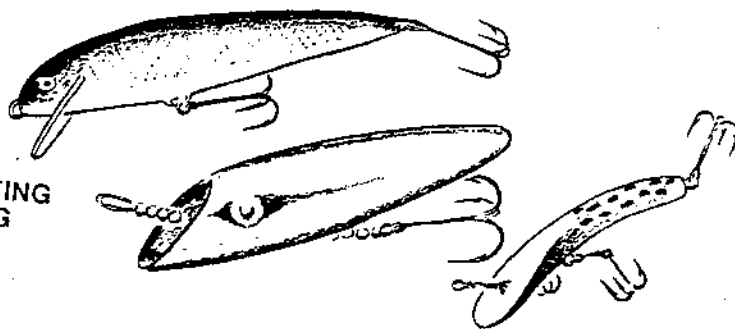
DEEP RUNNING



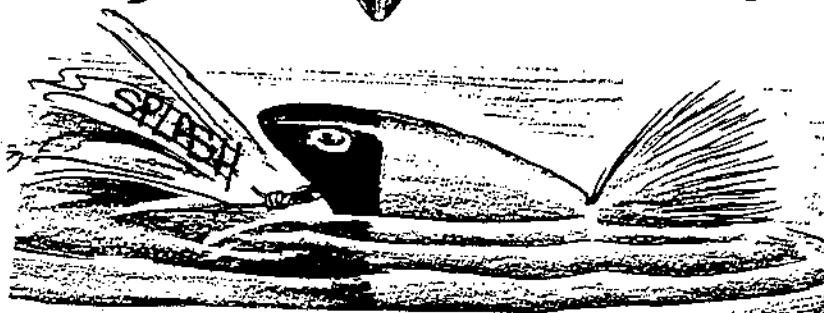
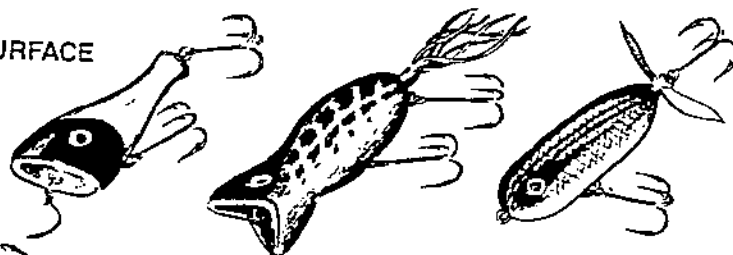
CRANK BAITS



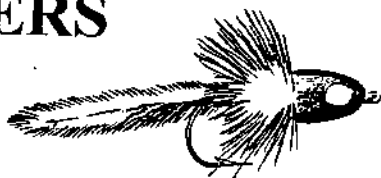
FLOATING
DIVING



SURFACE

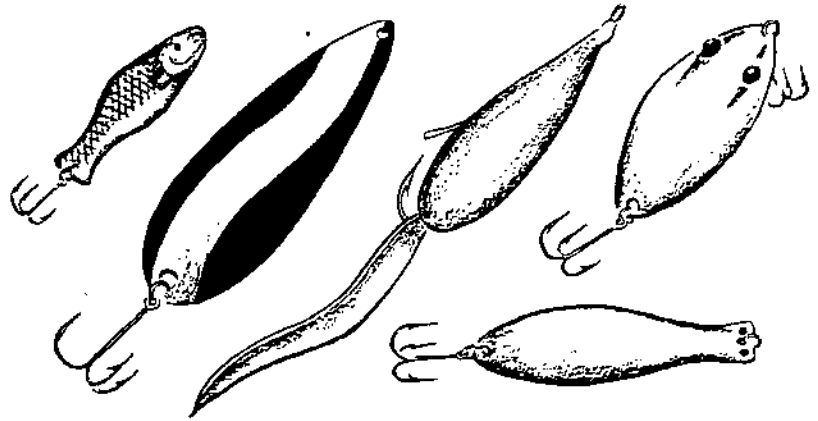


POPPERS

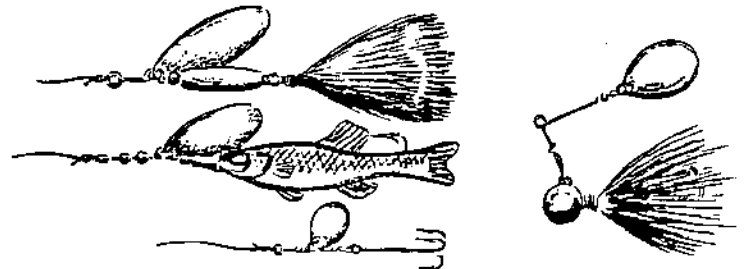


ARTIFICIAL BAIT

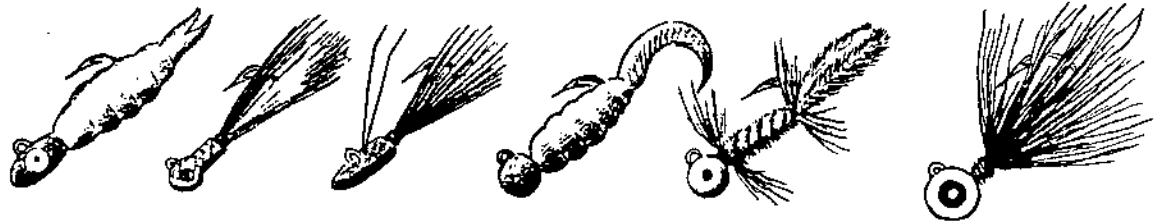
SPOONS



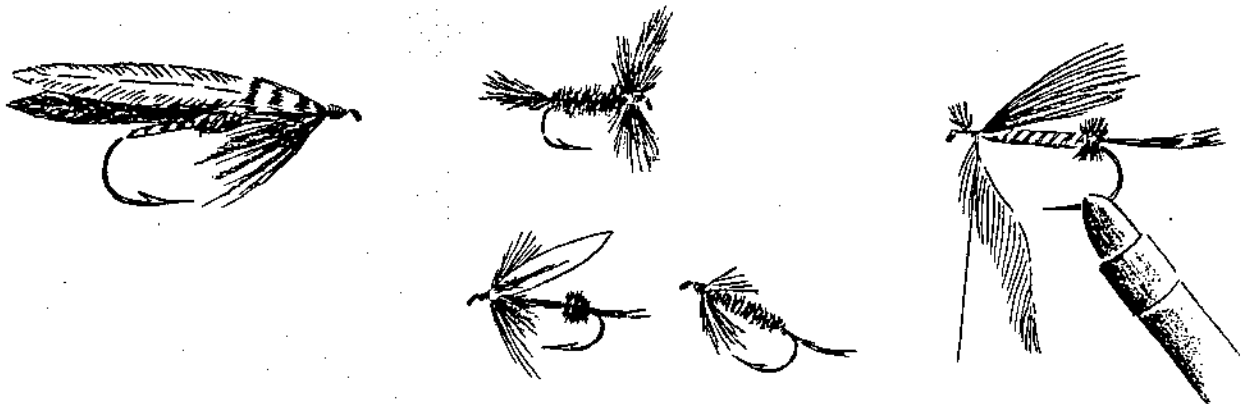
SPINNERS



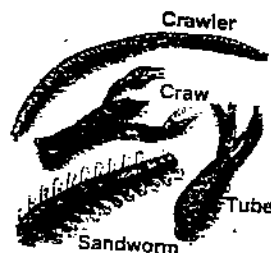
JIGS



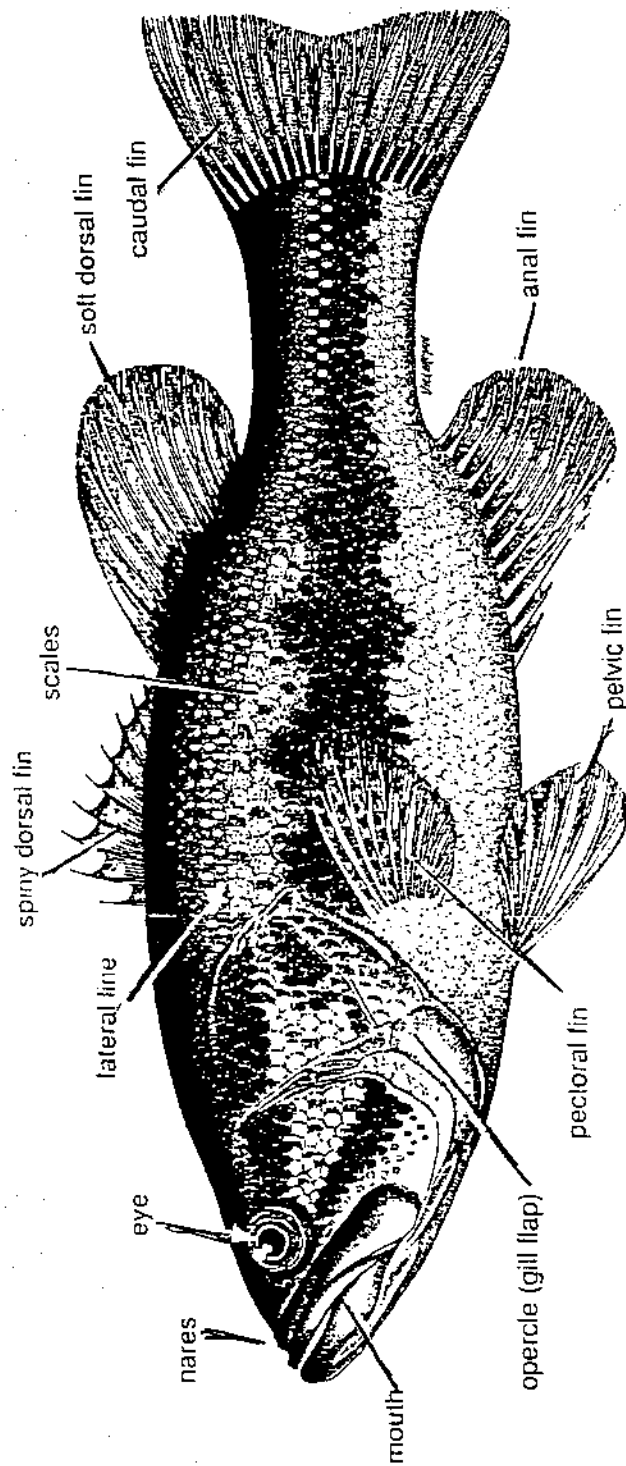
FLIES



THINGS PLASTIC (WORMS ETC)



TYPICAL FISH



TYPICAL FISH

