Missouri 4-H Sportfishing
Sportfishing Extra

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Hook Removal

The most common accident during fishing season involves hooks. The second most common hazard facing anglers is getting too much sun. Both are easily avoided. Sunscreen and a hat will handle the sun and a first aid kit with a little knowledge of how to use it will take care of the hook problems. We recommend that anyone working with kids take a First-Aid class

<u>The most important tool any angler should always have with him/her for removing a hook is a sharp pair of wire cutting pliers.</u>

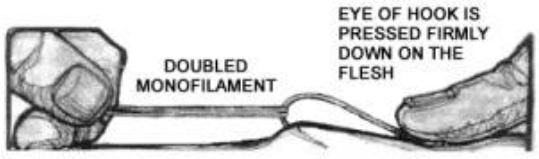
Two methods for removing hooks.

- When a hook's point and barb are protruding out the skin, it's easier to cut off the barb and back the hook out of the wound. Or cut off the eye and push on through. This is when those sharp wire cutters come in handy.
- The snatch method of hook removal is simple and effective, and it's the best method to remove a hook that's deeply imbedded in the skin and when the barb is buried.

This method is quick, simple and relatively painless, as long as you get it on the first try. The secret to a first time success is yanking the loop of line, which is wrapped around the embedded hook, rather hard so the hook comes out on the first try. The reason you should get it out on the first try is obvious, the patient might not stick around for a second try.

To perform the snatch method when the barb is imbedded, all that's needed is a short length of fishing line, at least 10 pound test, approximately 2 feet long.

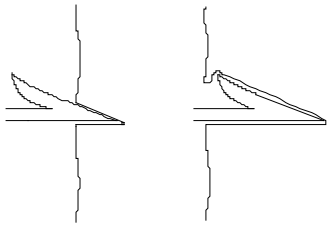
- Remove hook from lure.
- Double the fishing line and loop it around the hook, as close to the skin's surface as possible.
- Hold onto both ends of the doubled line, wrapping them around your hand for a firm grip and holding the line parallel to the skin's surface in line with the hook.
- With your other hand, press the eye of the hook down onto the surface of the skin and back toward the hook's bend, as if trying to back the hook out of the wound.
- While pressing on the hook eye, yank the line sharply, parallel to the skin and in line with the hook, to snap the hook back out of the wound.
- Apply antibiotic ointment, bandage wound and check to make sure tetanus shots are current.



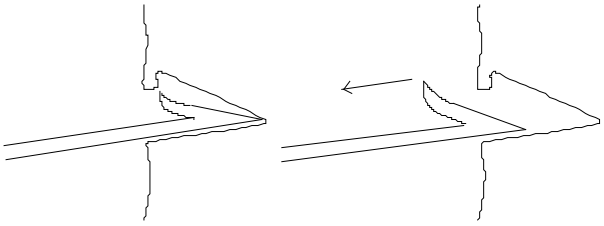
First Aid Kit A basic onboard first aid kit for anglers should contain sunscreen, small bottle of hydrogen peroxide, alcohol wipes. bandages, gauze, tape, antibiotic ointment and aspirin. Another essential should be brand new pair of needle-nosed and wire cutting pliers, sealed in a seal-lock plastic baggy. All Anglers, especially those using worms, should always have their tetanus shot up to date.

MORE: How far the hook penetrates determines how the method of hook removal.
If the hook does not penetrate past the barb, then just pull it back out.

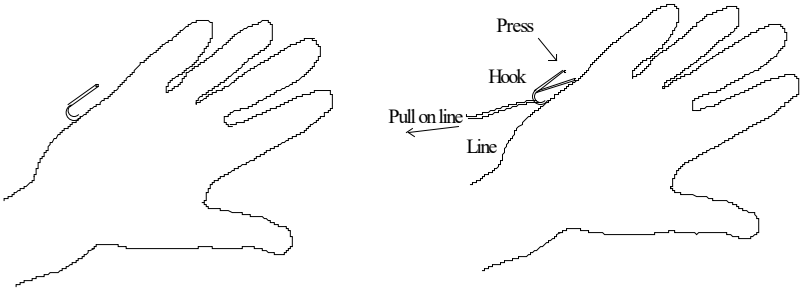
Remember how a hook is designed. The barb is designed to catch on whatever it penetrates. This is what makes removing a hook difficult. As the hook penetrates it makes a cone-shaped hole. As the hook goes in it stretches the skin, this skin pops back after the barb passes.



Now to remove the hook you need to reverse this. If you push down on the hook so that the barb is not catching skin, then the hook can be removed.



To remove the hook take some fishing line and double it up. Place this around the bend in the hook; now push down on the hook so that the barb will not catch the skin. Now pull the line popping the hook out.



Barbless Hooks: De-barbing, Sharpening and Using Them

Phil Genova[1] and Ronald A. Howard Jr[2].

A large number of anglers, particularly those who fish with flies, prefer to use barbless hooks. These hooks offer several advantages for the angler. They have a smaller cross section, making them penetrate better. This feature makes it easier to hook fish with the barbless or de-barbed hook. They are easier to remove from either the fish or the clothing or anatomy of the angler because they have no barb to catch on the way out. When catch-and-release is being practiced, this allows for faster, less traumatic handling of the fish. Since the hook tends to leave only a small hole or a slightly elongated hole in soft tissue, there is less tearing around it, less tissue damage to the fish, and a higher probability of survival if the fish is landed in a similar time to that taken using barbed hooks. Using barbless hooks may cost an angler a fish once in a while, but good technique can keep those loses to a minimum. If a tight line is maintained, the hooks hold well and result in relatively few lost fish.

Some manufacturers compromise between barbed and barbless hooks by offering hooks with mini-barbs, very low, short barbs. At least two styles of hooks are available currently without barbs. One is a simple, straight hook without a barb. Another features as small hump in the shank between the bend and the point. These are not available in all styles and sizes, however. Anglers who wish to use barbless hooks for fishing, or those who are required to do so by local regulations, must know how to de-barb their hooks without damaging the hook.

Regardless of how it is done, the process is easiest before the hook becomes part of a fly. Larger hooks can be de-barbed by filing the barb away carefully. Leaving a small, smooth hump where the base of barb was adds some security to the hook-up, but it is not necessary. While the hook is in hand and the file is available, this is a good time to sharpen the hook as well. Some anglers attempt to de-barb their hooks by cutting the barb away with a pair of wire cutters. This puts tremendous strain on the area from which the barb was cut. On small hooks that can further weaken what is already the weakest part of the hook, resulting in breaking points from the hook. Multiple missed strikes might be a clue that the hook is broken, but this process of counting coup on striking fish is taking the concept of catch-and-release a bit too far for most of us. A better alternative is to crush the barb down with a pair of pliers.

How the barb-flattening process is carried out is very important to the angler and the durability of the hook. The easiest way would seem to be holding the hook by the shank, inserting the barb cross-wise in the jaws of the pliers, and crushing it down into the cut from which it originated.

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Unfortunately, this obvious approach can be extremely damaging to hooks, particularly those that are tempered to be quite hard. The crushing process works the steel, often producing tiny cracks or breaks. If the point does not break off in the pliers, it will be likely to do so just when the trophy of a lifetime is on the other end of the line. The proper way to flatten the barb is to place the point of the hook in the jaws of the pliers tip first. This supports the metal as it is deformed and is less likely to cause breakage.

When the hook is being handled to de-barb it is also a good time to sharpen it. Several sharpening styles are in common use. Some anglers like to use a hone or hard carborundum stone and work around the point of the hook, bringing a sharper, needle-like point to it. Some like to file a diamond-shaped point with four sharply angled edges. Others prefer to use a somewhat triangular approach - flat on the bottom and pointed toward the top of the shank. The needle point is the most delicate of the three, easily damaged or rolled by contact with stones or hard mouth parts. The others are like cutting needles. They are designed to cut through tissue to embed themselves. These points are more durable and tougher than the needle point. They are also quicker and easier to touch up in the field.

Most anglers find a fine-cut file useful in sharpening large hooks. The file allows more material to be removed more quickly than does a stone. Smaller hooks and the final sharpening on larger ones should be finished with a fine, hard whetstone. Tapered stones, called slips, or specially designed stones for fish hooks work best with smaller hooks. Regardless of the approach used, the point should try to catch on a finger nail when the hook is dragged across it.

Sharpening hooks, like sharpening knives or broadhead blades, takes practice. But sharpness is one of the critical factors in solid hook ups on fish. The popularity of laser sharpened or chemically sharpened hooks in spite of their prices is testimony to the value experienced anglers place on sharpness in the hooks they use. Spend a little time learning how to sharpen your hooks, and the time will be rewarded in increased success.

The decision on whether or not to use barbless hooks is your own, a personal ethical decision that grows from experience and immediate objectives. It is not a one-size-fits-all decision or one that makes the angler ethically superior or inferior to those that elect the other course of action. The decision is unlikely to be the same for all species, all techniques, all waters and all personal objectives. We do feel that it should be included in the list of options for every angler, particularly in catch-and-release situations.

Raising Earthworms

Ronald A. Howard Jr.
Gerry Snapp, MO State 4-H Specialist (retired)

Earthworms are used by fishermen more than any other bait. They are the top choice for fish bait and will catch just about anything from bass and walleyes to channel catfish and bluegills. Unfortunately, earthworms are plentiful only in the spring and late autumn when the soil is moist. Rather than pay high prices for earthworms during the off-season, it is possible to collect and store nightcrawlers for the future or raise red worms. The worms may be dug from the ground or decaying vegetation, picked up from moist areas at night, captured using a worm fiddle or some other device, or purchased from bait dealers. Many types of worms can be grown as fish bait. Climate and the tolerance of the worms for heat or cold imposes limits on the production of earthworms or the selection of worms that can raised in some parts of the country. Large types commonly called "night crawlers" or "dew worms" and smaller types like "red wigglers" or "ringed worms" are commonly raised for bait or other uses. 1800 species of earthworms are grouped into five families and distributed all over the world. The most common worms in North America, Europe, and Western Asia belong to the family Lumbricidae, which has about 220 species.

- **Nightcrawlers**. This earthworm is common to the northern states and may be picked from fields and lawns at night for commercial fish-bait sale. Although very popular with fishermen, they are not commonly raised by hobbyists because they reproduce slowly and require special production and control procedures.
- **Field worms** (also known as garden worms). These make excellent fish bait and are often preferred by those who want a small number of worms for their own use. They are not prolific breeders, so are not recommended for commercial enterprises but may be okay for the occasional fishing.
- **Manure worms** (also known as bandlings, red wigglers, or angleworms because of their squirming reactions when handled). In the wild, they can be found beside streams, in rotting logs, and other damp rich food sources. Farm manure piles which sit in one place for more than a couple of weeks are seldom with a few. Moist, mildly warm, fairly constant temperature and lots of food are what they like. Manure worms are particularly adaptable production and are one of the two types most commonly grown by successful worm farmers.
- **Red worms**. These are basically another type of manure worm, differing mainly in size and color from their larger and darker cousins. They are also very adaptable to commercial production, and together with manure worms constitute about 80 to 90 percent of commercially-produced worms.

Bedding

The most readily available material for use as worm bedding is peat moss. It can be purchased at any gardening supply center. Other common bedding materials include newspaper, corrugated cardboard, and decaying leaf litter. The paper materials should be shredded into strips no greater than two inches wide. The first step in bedding preparation is to thoroughly soak it. Place it in a large container and add water while mixing it. You will find that peat is quite difficult to soak. Be sure that you soak all of the peat, as it doesn't easily absorb water. Bedding should be immersed in water for a couple of hours, until thoroughly wet. Peat should soak at least overnight before moving to the next step.

The ideal moisture content for worm bedding is approximately 60%. To achieve this, take hands full of your soaked peat or other material and "wring" it out by squeezing it. When only a couple drops of water is coming out, it is ready to add to your bin. Crumble it into the bin so that you don't end up with large "clumps". Continue until you have the bedding a depth of 6 to 7 inches. You are now ready to introduce your worms. It is advisable to have this done before you receive your worms. As soon as they are placed on the bedding, they will start to burrow to get away from the light.

Feeding

Healthy, fat worms are the result of feeding them a good diet. If your plans are to use them for fishing, it is of even more importance. Dairy, steer, horse, and rabbit manures, garden compost, shredded or chopped cardboard, wood or paper, or almost any decaying organic matter or organic waste product may be used as feed or to produce feed for earthworms.

The most convenient food is chicken mash, either chick starter or laying mash. You can purchase it in small quantities at most feed stores or larger pet shops. Do not buy what is called "crumbles". What you need is the finest ground mash available. Lightly sprinkle the mash on the top of the bedding. It is far better to put on too little food than too much.

Worms should be fed regularly, usually once or twice a week. Do not add additional food until what is there is completely gone. After feeding, lightly spray the food, which will allow your worms to easily consume it. The best guide to feeding schedules and amounts is the rate of consumption of the last feeding and the condition of the worms. When the last of the feed is gone, it is time to feed again.

If you plan to harvest some worms, do so before you feed. Never mix food into the bedding. It will cause a condition known as "protein poisoning" which is a build-up of acid within the bedding caused by the decomposition of the food. If you notice your worms dying, it will be a result of this condition. If you notice your worms dying, immediately remove them from the bedding and start with new. *This will not be a problem if you underfeed rather than overfeed your worms and don't attempt to harvest with food in your bin.*

Materials and Equipment

Earthworms can be reared in buckets, tubs, above ground boxes, and rearing pits. In each case, the rearing containers should provide for adequate drainage while preventing smaller worms from escaping the container. They are large enough to hold and grow a significant number of worms, but small enough that they can be handled easily when worms are to be harvested or sorted, or when growing media are being changed. Protection from predators is important in most areas.

Since most appropriate fishing worms are surface feeders, the worm bin should be relatively shallow (8 - 12" deep). If a bin is too deep, the moist materials can pack down, compressing air out, and create anaerobic conditions. The worm bin should be located where there is plenty of air circulation and in the shade, or in locations that receive limited direct sunlight. Worms tolerate a wide range of temperatures, but the most rapid feeding and conversion of organic material will occur at temperatures between 55 to 77ºF.

Extensions and Connections to Other Programs

Clearly, rearing worms can have a direct link to conservation or natural history programs. It could also provide an entry into entrepreneurship programs if the participant decides to raise worms for sale to bait shops or direct sales to anglers or if the dried worm castings are sold to gardeners or others wanting an excellent soil amendment. Gardening or horticulture projects can be enhanced by participation in a worm rearing project. Home composting by earthworms is popular. Woodworking or other engineering projects could become related if building projects are include

Raising Crickets

Ronald A. Howard Jr[3]
Gerry Snapp

Crickets are a preferred bait for many types of fishes. Crickets are one of the best baits you can use for catching panfish. They will catch fish when every other kind of bait won't. An angler my catch, buy, or raise crickets for their own use.

There are several ways you can catch crickets. The first way is to go out early in the morning and look for them around woodpiles or around rotting vegetation. If you go early before the morning dew is gone, you will find the crickets will be much easier to catch. Be careful though, snakes like to hang around woodpiles as well. Another way to catch them is to bait them. Coat some bread crumbs with sugar and spread them on the ground in the evening. Cover the bread crumbs with a newspaper. In the morning lift up the newspaper and collect the crickets.

However, many anglers prefer to rear their own crickets. The equipment needed is simple, inexpensive and easily maintained, and rearing procedures are relatively simple. Approximately 400 crickets can be reared every three months for every 450 square inches of rearing space (about the size of a five gallon bucket).

Materials and Equipment

The following materials are needed to make a cricket rearing facility.

one of more well-cleaned grease, paint or food containers
window screening
tape or other attachment mechanisms
chick watering fount (or equivalent)
sand
excelsior or coarse, dry hay
poultry laying mash
saucer or tray
rain shelter
insect control

Setting up a Cricket Rearing Facility

Large grease, paint or food containers approximately 18 inches in diameter make excellent rearing containers. Start by thoroughly cleaning the containers. If metal containers are used, sand the top few inches of the inside of the can to a smooth finish and wax it with a hard furniture wax. This helps to keep the cricket in the can. Prepare a piece of window screening to fit tightly over the top of the can. A firmly attached screen will prevent entry by unwanted pests and keep the crickets inside. Add about 4 to 6

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inches of clean, dry sand to the bottom of the can and moisten the sand until it feels damp to the touch. Place a small glass poultry watering fount (basically a glass jar turned upside down in a pan) in the center of the rearing container, and fill the pan with cotton batting to a level just above the water level. Set one or more saucers or small trays of laying mash on the sand and cover the sand with about 4 or 5 inches of excelsior or coarse hay, pulling it up around the saucers and watering fount. Be careful not to create a siphon that will cause the fount to drain into the sand and cause the sand to become excessively moist. Stock each container with 20 to 30 adult crickets, about half of them males and half females. Female crickets can be recognized by the presence of a long ovipositor protruding from the end of the abdomen. Adult crickets have wings. Young crickets can be stocked, but the time required for the first crop of bait crickets will be longer. Place the container in an area where it will maintain a temperature of 80 to 90 degrees Fahrenheit, and arrange to protect it from rain if the chamber is set up outdoors. If ants are a problem in the area, use an insecticide or some type of barrier to prevent their attacking the crickets.

Rearing Crickets

Normally the sand need not be moistened again for about three months. Crickets need relatively dry sand to have the young remain free from disease. Clean the watering fount, replacing the water and cotton every four to eight weeks. Keep food readily available at all times. Plan on replacing food every two to three weeks when crickets are small and every four to five days when they are larger. Replace food as needed.

Adult crickets lay eggs at intervals of approximately 30 to 50 days, laying them in slightly moist sand. The eggs hatch in 15 to 25 days, and the young crickets grow very rapidly at the prescribed temperatures. They reach bait size in about a month of growth at that temperature, and they will reach sexual maturity in one or two months. They can survive, but will grow and mature much more slowly, at temperatures significantly above or below that range. Shade will help to keep temperatures down during hot weather, and artificial heat, like a low wattage bulb suspended inside the container, can be used to raise the temperature under cooler conditions. **Caution: The heat from a light bulb placed too close to the excelsior or hay may cause a fire!**

Two to four crops of crickets can be reared in each container without cleaning the container. Generally, larger crops will be obtained if the containers are cleaned and restocked with adults after every second crop of bait crickets.

Fishing with Crickets

The most common way of fishing with crickets is with a float or bobber. I use a #8 or #10 live bait hook. Add a split shot about 6 inches above the hook. Use as little weight as possible. This will make the cricket fall through the water at a more natural weight. Insert the hook right behind the head of the cricket and let the barb of the hook exit the middle of the back. A pencil style float is a good choice for panfish. Start with the bait set a 3 feet below the surface. If you do not start getting strikes within a few minutes, raise or lower the bait until you start getting strikes.

Additional Information Sources

Many sources of information can be used to further your production of crickets. You might start with E.

Lawrence Palmer (1954) *Crickets as Bait*, from the National Wildlife Federation, Earl F. Kennamer, Leaflet YA-11, Auburn University Extension Service, Auburn, AL, or D. T. Gardner, *Fish Bait Production*, Circular E-33, Cooperative Extension Service, Auburn University, Auburn, AL. Consult your local Cooperative Extension Agent for additional information if needed.

Extension s and Connections to Other Programs

Clearly, rearing crickets can have a direct link to entomology and conservation or natural history programs. It could also provide an entry into entrepreneurship programs if the participant decides to raise crickets for sale to bait shops or direct sales to anglers. Woodworking or other engineering projects could become related if building projects are included.

Rod Work - Repair, Balancing and a Hook-Keeper

W. Jeff Farris, Missouri Sportfishing Team

ROD REPAIR

Tips

Repairing a rod tip is one of the most common rod repairs. There are two main types of repair. One is when the rod is broken at the tip. Repair is appropriate for rods with only the last inch or so is broken. Any changes in the length of the rod will affect the rod's action. If only a small part of the rod is missing the effect will not be very much. To repair: find a tip that will fit the end of the rod. Rod tip repair kits are available from many sources that have a glue stick and a few replacement tips in it. It is a simple matter of heating the glue, with a lighter or candle, applying the hot glue on the end of the rod and sticking the new tip on. Make sure the tip lines up with the other guides on the rod.

The second type of repair is the insert in the tip is broken. This will nick and even cut line as it passes through. If the wrapping does not cover the tip tube, all that is needed is to heat up the old tip and pull it off. Replace the tip with one of the same size. Sometimes the wrapping will cover the tip tube. In this case, the wrapping must be removed. To remove the rod wrappings cut the thread to get it started. Once started, just un-wrap the thread. Replace the tip with a new one. To make it match the way the rod looked before you will need to re-wrap the rod like it was before.

Guides

Replacing guide is like putting them on, only reverse the action first, and then do it again. The most common reason guides need to be replaced is because the insert is broken. If the guide is still on the rod, removal of the old one is the first step. Do this by cutting the thread that is holding the guide on. If it a single-foot guide you only have one side to do this to, but if it is double-foot guide there will be two sides. Once the thread is cut you should be able to unwrap the threads holding the guide on. Mark the location where the guide was with some tape or a grease pencil. Start by temporary attaching the foot with tape. Now wrap thread on the guide to hold it in place (see rod build article on how to do this). And then finish the job by coating the threads with sealer and preservers.

Checking Guides

Rod guides need to be checked periodically. The inserts in them can break and cut your line. To check the guide take a Q-Tip swab and run the cotton tip around the inside of the guide. If any of the cotton fibers are left on the insert then is likely that the insert is cracked and should be replaced.

Making a Two Piece Rod from a Broken Rod

If you've fished very long, you have had a broken rod. Don't despair! If a rod is broken somewhere close to the middle, repair is possible by turning it into a two-piece rod. First the proper size ferrule must be determined. After that determination and after securing the correct ferrule, it is a matter of putting it on the two-piece of the rod. The ferrule is glued on with epoxy. Once the ferrule is in place you might want to wrap the area around the ferrule to make it look better, but this is not required. This is the simplest way to make a rod that is broken in half, a two-piece rod. Something to realize is that if the break is not near the middle, you may not be able repair the rod without messing up the action or weakening the rod. There are other ways to make ferrules or two-piece rods, but they are for much more advanced rod builders.

Un-repairable Rods

Sometimes when a rod breaks there is no way to repair them. But some of the parts can be salvaged for further use. If the guides on a broken rod are still good take them off, save them, and use them to replace broken guides on other rods when needed. If nothing else is salvageable then the rod can be cut up to be used a stirring stick, or whatever else these sticks can be used for. Shortened broken rods can be use to practice techniques. I do this to practice techniques like working jerk baits, or "walking the dog". During the winter mounts you can work on them while watch TV, by putting a reel on the rod. This way the rod is not hitting everything in the room.

BALANCING A ROD

Why Do You Need to Balance a Rod?

Most rods are not balanced. The more expensive a rod will is, the more likely to be balanced. This is because the material of the more expensive rod is so much lighter that when the handle and other stuff is added that they nearly compensate for the weight in front of your hand. The reason for a rod balanced is that it puts less strain on the muscles in your arm. If you are having to balance the rod with these muscles they are working more than they should. Now if you only fish a few hours a year this will not be something that you would notice much. But if you use them 8 to 10 hours a day for 200 days a year it becomes a problem. The main difference will be in how well you feel the hits with the rod. If I need to grip the rod tighter (because of not balanced) the less I will feel the strike, the lighter I grip the more I will feel. Another problem with an unbalance rod is of tendonitis developing over a period of a long time. Many Pro fishermen have run into this problem.

Adding Weight to Back End

Balancing a rod is a simple task. Kits are available from tackle suppliers or you can do-it-yourself with washers and a screw. Basically all that is needed is to add enough weight behind the point where you grip the rod -to counter the weight of the rod in front of your grip. Place a screw in the center of the end of the butt of the handle. On this screw mount enough washers to compensate for the weight of the rod in front of the handle. The washers should be the same diameter as the rod butt. For a spinning rod, hold the rod (reel on) just like you would to cast. You will have the stem of the reel between your middle finger and your ring finger; now add weight until the rod balances there. For bait casting the rod should balance right below the center of where the reel is mounted.

Finish It Off

I have used large heat-shrink plastic to cover and keep the washer from coming off. I'm not sure where you can find it, but it does do a nice job. The shrink warp needs to be bigger than the rod butt. Electrical tape or friction tape will work, but remember that anything that adds weight need to be accounted for when balancing the rod. There are probably other creative ways you can think of to finish it off.

Store Bought Version

As I noted before you can buy kits to do this from some tackle stores. Bass Pro Shop and Cabela's both offer kits in their catalogs. Of course, the cost is more than washers, but they will look nicer on the rod.

ADDING A HOOK KEEPER

Rod Building Style-Wrapped on

You can add a hook keeper many ways; the most common is by wrapping one on the rod. There are many types available through suppliers of rod building parts. The simplest type is just a bent piece of wire that forms a hump. It is simply wrapped onto the rod. Another is a folding loop, which is nice because it can "folded" out of the way when not being used. This type is normally installed when the rod is being made. They can be added later, but getting wrapping threads to match is not always easy.

Store Bought Quick Style

Another option is to buy one. Fuji has what they call the "EZ Keeper", it is a plastic piece that is mounted on the rod with some rubber "O" rings. This work great and only cost a few bucks.

Tie Wrap and a Split Ring

The easiest to do and cheapest option is using a tie wrap and a split ring. Take the tie wrap and put it through the split ring, now strap the tie wrap to the rod at the location you want the hook keeper.

Coat Hanger Fish Hook

W. Jeff Farris, Missouri Sportfishing Team

Making Teaching Aids:

Teaching aids are anything that helps you get your message across. The coat hanger fishhooks help teach knot tying. It helps by making knot tying bigger and easier to see what is happening. Most teaching aid are simple to make.

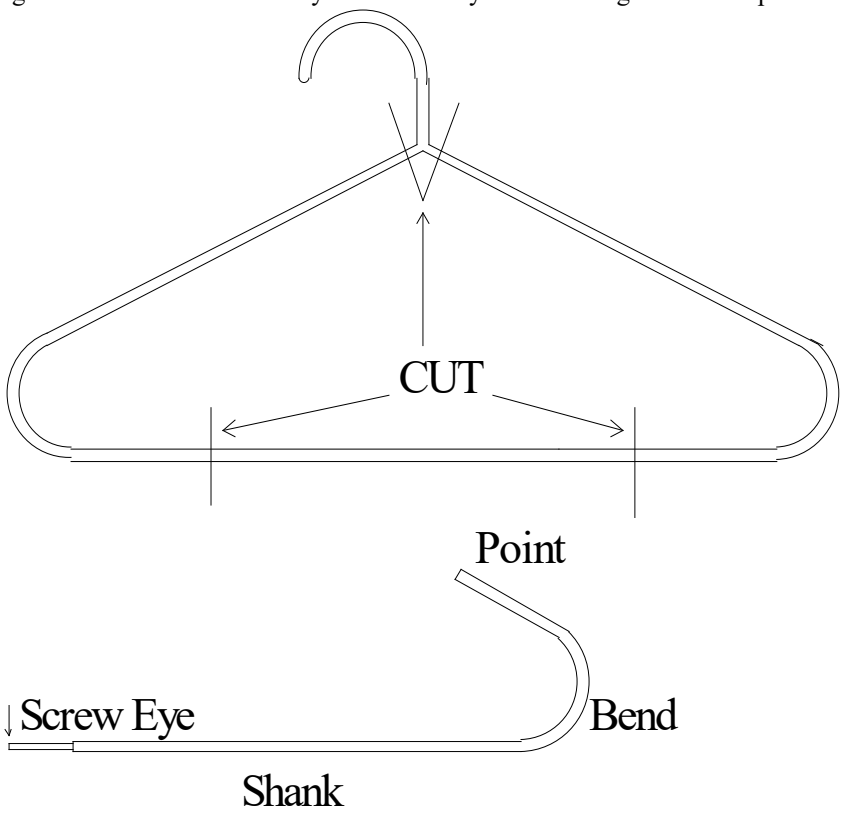
COAT HANGER FISHHOOKS

Tools Needed: Drill and bits
Cutters (Heavy Wire Cutter or Tin Snips)

Materials Needed;
Plastic Coat Hangers (Heavy)
Screw Eye
Nylon Rope

Take plastic coat hangers and cut into fishhooks. To do this cut the hanger on both sides of the curved part of the hanger that it hangs from. The diagonal sides will be the hook shank. Next measure about two to three inches from the each bend and cut the section joining the two bends. Each hanger will make two fishhooks. Put the screw eye into the hook. To do this drill the end of the long part (shank) with a small drill bit. The bit should be just smaller then the screw eye. Drill the end out makes it easier to install the eye. Screw the eye into the end. The eye should end up being perpendicular to the hook point. Repeat this until you have the quantity of fishhooks needed.

Cut the rope into pieces. A one hundred-foot piece of rope will yield 12 equal pieces of 8 1/3 feet each. Finish the ropes by melting the ends. Be careful hot nylon will burn you. Finishing the end keeps them from unraveling.



Fish-Match Mixer

Ron Bacon

Best Time: First meeting of the group, repeated whenever the group needs to be divided into pairs.
Best Location: Wherever the group meets
Time Required: 10-15 minutes, depending on the size of the group.

Objectives: Participants will

1. Learn characteristics about indigenous fish species
2. Learn name and something new about their partner
3. Practice communication skills
4. Experience system that divides group into pairs
5. Have an enjoyable and social experience

Youth Development Objectives:

1. Develop interpersonal communication skills
2. Increase self-esteem

Evaluation:

1. Do participants have enough basic knowledge to "match" their fish picture?
2. Can the group be divided in an effective and timely manner?

Materials: Individual color plates (pictures) of fish indigenous to the area. Different species for every 2 participants. Each fishplate (to be cut in half) should be large (8 ½ x 11") in size and laminated for repeat use.

Narrative: This lesson has 3 basic purposes:

1. Serving as a group social mixer, allowing participants to meet one another
2. Divide group into pairs for future instructional purposes
3. Learn specific information on local fish species

Randomly pass out the one-half color plates to the group (one per participant) with instructions that they need to find their other half (match). When they find their match, quickly have them introduce themselves to one another. They should tell their new partner something that can be used to introduce them to the group. Discuss your "fish" and be ready to give one or two characteristics of the fish to the rest of the group.

When it appears that the matches are made, introductions and fish dicussion are complete, call the group to order. By pairs, have each fish team member introduce their other half by name, and one or two particulars on the person and a characteristic of their fish. Once the entire group has spoken, you now have teams for the first paired activity.

The mixer can be repeated every time you need to divide the total group into pairs. AT the end of 5 or 6 paired activities, most participants will know the names and have some background on the other members of the group as well as be familiar with different fish species.

If you need to create groups of 4 or more, you can group according to families such as sunfish, trout and salmon, catfish, pike, etc.

Alternate to the verbal explanation. The specific characteristics of each fish could be listed on sticky labels attached to each ½ of the fishplate. Each time a match is made, write down a new characteristic. At the end of the day(s), the participants should have a thorough description of that particular species of fish.

Name Tag Knowledge and Needs

Ron Bacon

Best Time: First meeting of group, repeated daily if necessary

Best Location: Wherever the group meets

Time Required: 5 minutes

Objective:

1. Identify individual skill strengths and skill deficiencies of participants with the intent of promoting on going mentoring to work on deficiencies
2. Promote communication among the group

Equipment: Self-adhesive labels 3”x 2” and pens

Narrative: At the beginning of every day, participants will write on self-adhesive label three of their angling skills which they would be willing to share with others. Also listed should be three skills with which they would like assistance. These labels are then attached on the bottom half of their name tags. Throughout each day, as time permits, participants should focus on sharing their expertise on this knowledge and needs basis (mentoring one another). The label listing can and probably will change on a daily basis.

Evaluation: At the end of this week, participants should have had an opportunity to both mentor and be mentored by their fellow participants, thus increasing their own knowledge in angling skills and mentoring.

Games – Skill Building Activities

Ron Bacon

Utilizing games as a part of the instructional unit introduces some "fun" into the often-boring aspect to practice, practice, and practice. The slogan "practice makes perfect" is most appropriate for proficiency in angling skills. The games used are examples of how you can enhance skill development!

Best Time:
Anytime after a casting unit is taught. Preferably as a summary activity after all casting units have been completed.

Best Location:
Anywhere outdoors- parking lots, open spaces, athletic fields. Indoor can be conducted in a gymnasium or a large room, but not preferred.

Time Requirement:
30 min to 2 hours

Objectives:
1. Participants will:
2. Practice proper casting techniques in bait, fly, and spins casting an spinning
3. Increase opportunities to be proficient in hitting desired target.
4. Practice safety awareness.
5. Have fun while practicing.

Youth Development Objectives:
1. Practice responsible behavior.
2. Practice fine and gross motor skills
3. Enhance hand/eye coordination
4. Enhance self-esteem and self- confidence
5. Experience in team building.

Equipment:
Rod and reel of choice, utilizing soft casting plugs or a yarn flies. It is suggested that similar lines and plus should be used in most cases. Targets made from cardboard and simulate fish can be used in some games.

Fish On
Working in pairs, have one participant cast the plug some distance. Then have the partner pick up the plug and act like a fish. Caster must retrieve the "fish", keeping the line taut and rod bent. This action simulates the actual experience of bringing in a fish. Have partners trade roles and repeat.

Roving Plug

A small group roves through a backyard, field, or meadow. Someone picks out a brown oak leaf, a small stick or a stump 30 to 80 feet away and challenges the others to cast closer to it than he/she does. Each person casts. The nearest cast scores 1 point. If a hit is made a 3-point bonus is scored. The caster coming closest to the object picks the next target. In this game, instead of retrieving the plug the caster walks toward it as he/she reels.

Plug Bombardment

Two teams compete for a specified period. The team scoring the most hits on the target or target wins. Alert judges are needed unless the targets used can be heard when they are hit.

Box the Compass

Eight targets are arranged in a circle with a 40-foot radius; the caster is at the center. These targets are arranged so that one in north of the caster, one is south and the others are east, west, northeast, southeast, southwest, and northwest. The caster must hit each successive target before he goes on to another. The lower score wins; that is eight points would be perfect.

Challenge

One caster challenges another to ten or more casts with targets at a specified distance. Competing casters decide who goes first and then alternate until each has cast the agreed number of times. The caster scoring the most hits wins. If a tied results, each of the two casts five or more times until one of them wins.

Rod N' Reel Golf

Using a rod n' reel, casting plug or yarn fly combination. This game is played the same as golf. You count the number of casts (strokes) necessary to eventually cast your plug/fly into the target – plastic pan, tub, etc. (cup). Each new cast begins where the previous cast ended up. Any number of persons can play, but this game is best suited to the usual twosomes, threesomes, or foursomes. The course can be laid out in most outdoor environments, with safety precautions taken to avoid conflicting use, and can be as sophisticated as one desires with tee markers and yardage signs. Most courses are either 9 or 18 targets (holes).

Winning team is determined by the least number of total casts (strokes) after playing the entire course.

Angler Skill-a-thon

See *"Sportfishing Skillathon Excitement"* (pg 28) in the *Sportfishing Helpers Guide* manual for more information and details.

Best Time

The skill-a-thon can be used as a skills review session following the lessons in the curriculum guide.

Time Required

Allow 5-10 minutes for each angler review station.

Objectives

- Participants carry a check-off list requiring that they demonstrate certain angling skills and mental processes indicating that they have benefited from the course.
- Participating young people will experience a greater understanding of ethics and responsibility required of an angler.
- Participants will have an opportunity to acquire life skills such as leadership, problem solving, communication and establishing a personal code of ethics.
- Participants will review all skills learned in previous lessons.

Evaluation Activities/Suggestions

Based on the outcome of the skill reviews, the leader will be able to evaluate learned angler skills. The level of accomplishment should equate to the members age and ability.

Roles for Junior and Teen Leaders

Youth leaders can help administer the various reviews at each skill review "station."

Potential Parent Involvement

Due to the nature of the skill review session, adequate supervision is important. Leaders are encouraged to involve other adults at the various skill review "stations."

What's a Skill-a-thon?

A skillathon is a series of learning stations at which teams are presented with realistic situations and tasks to do. The teams attempt to complete the tasks before being told or

shown how. The facilitator at each station follows with questions to help the teams build on their experiences.

When preparing for a skillathon, utilize the youth in your group to plan stations.

Leader Tips

The oral and demonstration test may be administered at the end of each lesson period or may be given as a "Round Robin" overall skill review at the end of the year. Make the test fun and a demonstration of skill and knowledge in a "No-Fail" atmosphere rather than a stress-producing event.

Suggested Stations for the Skill-a-thon

These stations are not intended to be the only stations possible. There are countless other possibilities. Do not be afraid to plan your own.

Station #1

The leader/volunteers will check on the ability of members to complete the following skills: (very young members can be helped by older members/volunteers to achieve all station goals.)

1. Casting closed and open face rod/reel at a target. 2. Tying and naming two knots.
3. Tying rigging of fresh and salt-water tackle for bait.
4. Identifying artificial baits for two types of fish.

Station #2

The leader checks on the ability of members to explain and demonstrate:

1. Proper catch and release procedures - physical methods demonstrated with a "pillow fish" to prevent damage to the fish.
2. Why catch and release procedures are important to fish survival as wild breeding stock.

Station #3

The leader checks on the ability of the members to find and interpret the catch rules for two fish in their region. State sportfishing regulation booklets are available from many nearby license agents.

1. Members cross reference the codes, catch limits, size restrictions and open seasons of two species of fish located in their region. They orally report their findings.

Station #4

The leader will orally ask members questions about water safety issues:

1. Members demonstrate the proper wearing and "cinching-up" of a life jacket.
2. Members demonstrate the non-contact method of rescue by throwing a ring buoy to a target spot 25 feet away and how to get help.
3. Members demonstrate the safe way to remove an embedded hook from a bar of soap.

Station #5

The leader asks members to identify structures and temperatures most likely to find fish.

1. Members identify the most likely structure fish will be hiding under from a picture or slide of a nearby pond or river. The importance of the thermo cline should also be included.
2. Members identify the components of the fresh or salt-water food chain and their importance to the survival of fish.
3. Members will identify and explain the function of a fish's body organs and parts.

Station #6
The leader asks member to explain the function of the Water Cycle and the importance of clean, non-polluted water.
1. Members identify some of the chemical and waste pollutants that degrade our surface and subsurface water supplies.
2. Members identify some of the other degrading factors of the water such as discarded monofilament line, styrofoam worm cups, etc.

Station #7
The leader will ask members to explain their personal commitment about "getting involved with fish."
1. Members reflect upon their feelings about what a good steward of the resources entails.
2. Members describe their own personal code of ethics.
3. Given a hypothetical situation relating to fishing, have members describe how they would respond to this dilemma.

Go Fish!

Adaptation of *"Oh Deer,"* Project Wild

This learning activity is most appropriate for use as an Aquatic Ecology activity, but it can be used in a variety of settings whenever "have fun while learning" is appropriate.

Objectives

- Participants will be able to:
- Identify and describe food, water, and shelter as three essential components of habitat.
- Describe the importance of good habitat for fish.
- Define the term “limiting factors” and give examples.
- Recognize that fluctuations in fish populations occur, because ecological systems undergo many changes.
- Describe how fishing is a positive tool for fisheries management.

Timing
Great immediately after a brief introduction to what types of living organisms an aquatic ecosystem can support, or after collecting aquatic life (in the “Pour A Pond” activity).

Duration
About 30 minutes, but fun enough to be longer.

Location
Large area outside (20’ by 30’ area for running), or in a gym or large hallway.

Life Skills
Verbal and nonverbal communication, decision-making, critical thinking, responsibility, and contributing to group efforts.

Background
This game focuses on habitat, which determines whether an animal (such as a fish or aquatic insect will survive in an area or not. This activity is a fun way to demonstrate major impacts of habitat changes on fish populations.

Materials

- Newsprint pad (flip chart) and markers, or chalkboard and chalk
- Sticky notes (medium-large)

Procedure
Pre-Activity

1. Divide the participants into groups of five or six and hand out about 10 sticky notes to each group. Tell the participants that they are to discuss things that they as a group think may affect or are important to a fish’s life. These things can be very specific (e.g., insects, pollution, rocks, oxygen, etc.). They must decide which are most important to the fish and list them individually on a sticky note in large letters. Give them 10-15 minutes to accomplish this.
2. Have each group present its conclusions by bringing their sticky notes up in front of the room and placing them on a blackboard, wall, or window so everyone can see them. There will be a number of duplicate answers.
3. Next, have the participants look over the notes, and ask for volunteers to come up and lump the notes into similar/like categories, as few as possible. At this point see if the group can narrow down the grouping even further. You should be able to see that the notes can fit into one of four categories: Food, Water/Water Quality, Shelter, and Space/Competition.
4. Tell them that together these four categories are needed for any animal’s habitat. Now they will play a game about habitat.

The Activity

1. Tell your group that this activity introduces them to how fish survive in their habitats—areas that provide the basic needs animals have for surviving and reproducing. Ask your group: What do fish and aquatic animals like insects need to survive? (Food, shelter, water, and space.) Tell them that this game will show them more about fishes’ needs for food, shelter, and water.
2. Start the groups in a large circle. Tell them they are managing a pond for fishing, and it

will be necessary to stock (add fish) to get the game started. The center of the circle is the playing area and the fourth component of habitat, space. Choose two to four participants to become the stocked fish and send them to one side of the circle. The rest of the groups are habitat and go together to the other side of the circle. Mark two parallel lines on the ground about 20 feet apart. Have the fish line up behind one line and the rest (habitat) behind the other line.

3. The fish need to find food, water, and shelter. When a fish is looking for food, it should clamp its hands over its stomach. When looking for water, it moves its hands to its cheeks imitating water moving through gills. When looking for shelter, it holds its hands together over its head. A fish can choose to look for nay one of its needs during each round of the activity.
4. Those playing the role of habitat also need to choose which component of habitat they will be: food, water, or shelter. The habitat participants then make the sign showing which component of habitat they have chosen to be.
5. The game starts with all players lined up on their respective line and with their backs turned toward each other.
6. The group leader begins the first round by asking all the players to choose what they will be and then make that sign.
7. Tell the players that a fish cannot change what it is looking for once it has seen what is available. Remind the players to keep doing their signs until they have found a match. When you see that he players are ready, count "One…two…three…Go Fish." At that point the players turn to face each other while they continue to hold their signs.
8. When the fish see the habitat component they need, they are to move to it and tag it. Each fish must hold the sign until getting to the habitat person with the same sign. Each fish that reaches its necessary habitat component takes that component back to the "fish" side. When more than one fish reaches a habitat component, the fish that gets the habitat item first survives.
   Any fish that fails to find its food, water, or shelter dies and becomes part of the habitat in the next round. The fish that died is a habitat component and so Is available as food, water, or shelter to the fish that are still alive.
   Habitat components stay in place on their line until a fish tags them. If no fish needs a particular habitat component during a round, the habitat component just stays where it is in the habitat line. The habitat person can change which component it is from round to round but not after seeing what the fish signs are. Many kids would rather be fish, so this rule is important.
   Point out to the players that as habitat declines, competition to gain the needed things for survival will be great. Remind the group of the rules, and that pushing and shoving are out of the question.
9. The group leader or helper (playing the role of a "fisheries biologist") keeps track of how many fish there are at the beginning of the game (i.e. year one) and at the beginning of each round (i.e. year two, three, four, etc.). Participants will use these numbers to create a graph with number of years on the X-axis (horizontal) and number of fish on the Y-axis (vertical).
10. At the end of at least five rounds, gather the players together to discuss the activity and the graph. (This can be done indoors, individually or as a group.) Encourage them to talk about what they saw. For example, ask them to describe how the numbers of fish changed over time.
    The players should say that they saw a small population of fish finding more than enough of its habitat needs. Then, the population of fish expanded during the next two to three rounds (years) of the game, until the habitat was depleted and there was not sufficient food, water, and shelter for all the members of the school of fish. At that point, the fish died from starvation, didn't have good water, or lacked shelter. These are called limiting factors (the condition or amount of something that limits the number or distribution of a particular organism). When the fish died, they returned nutrients to the habitat.
11. Add an angler to the game. Have the angler stand at the side, between the fish and habitat. Allow the angler to catch a specified number of fish by touching them before they get to the habitat (e.g., the pond owner sets a fishing limit of two fish, as a rule). This version of the game will introduce the concept of fisheries management involving fishing.
    After the round the anger can choose to keep and eat the fish (return to habitat) or release them back to be fish again. Ask the players: What would have happened if no fishing limit (regulation) was imposed? What would happen if the habitat completely lacked one component of habitat (such as food)? (The

population would "crash.") End by describing to the players that fish populations depend greatly on their habitats, and that in order to take the best care of our resources we and biologists need to understand not only the fish but all of the things in the habitat that fish need to survive and reproduce.

Tips for Success

- Safety first! Clear the playing area of stones or other debris before playing. Remind players to be careful while running.
- It is helpful to have adult or teen observes help with the game. Have those who can't run play the role of the fish biologists and record data.

Adaptation

Play various versions of the game: Introduce predators and other mortality factors. Have players create their own adaptations! Devise a way to introduce into the game the concept of carrying capacity (the maximum and/or average number of a given organism that an area can maintain at a particular season of the year).

Extensions/Additional Resources

Follow up the activity by contacting your local Missouri Department of Conservation office to learn about local fish population trends. Talk with a biologist and invite him/her to speak at your next class or club meeting.

Community Service

- Older participants can work with younger groups to each these concepts to a younger age. For example, volunteer to go into a school, scout meeting, or camp setting and offer this game.

- Work with a local biologist to improve the quality of the aquatic habitat in local lakes, rivers, or streams.

Exhibits/Sharing

Create a display about how fish populations change over time as habitat changes. Explain to community members the reasons to be good stewards of our water ecosystems.

Career Opportunities

Fisheries manager, biometrician, statistician, biology teacher.

Source

Adapted by Mark Stephens, Project F.I.S.H.; Brandon Schroeder, Michigan United Conservation Clubs; and Carl Richardson, Pennsylvania Fish and Boat Commission, Bureau of Boating and Education.

This activity appears in the National 4-H Sportfishing Curriculum, and is an adaptation of "Oh Deer" from *Project Wild, Secondary Activity Guide*.

Carolina Clacker and Steel Leaders

Carolina Clackers are used to rig for Carolina rigs (a plastic bait rig).

Steel leaders are used fishing where the line is at risk of damage such as when fishing pike, muskies, or walleyes or when fishing in rocky areas.

MATERIALS:

Nylon Covered Steel Cable
Brass Bullet Weights
Snap Swivels
Swivels
Crimpers
Crimps
Glass Beads

ASSEMBY PROCEDURE:

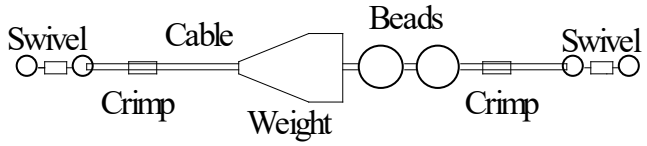
Carolina Clacker

Determine the size of steel cable you need for your application. The cable or leader wire is sold by the diameter, which determines it strength or pound test. Determine what size crimps (or leader sleeves) you will need for this size cable. The supplier will list this information for you. For the Carolina Clacker I prefer .028 inch or 45 pound test cable, in black. Cut the cable to the length you desire, remember that during the crimping process some of this length is used. This process will use an extra ½ to 1 inch for each crimp. Take the cable and slide on one crimp. Put a swivel on the cable. Now bend the cable back through the crimp. Slide the crimp up or pull the cable to make the loop smaller, but not to tight. Now using the crimpers, crimp the crimp. After crimping the crimp should have some cable sticking out on one side and the long length of cable on the other. They should be lying side by side. The crimp itself should look like a ”B” on its back. The cable should not move in the crimp. On the open end of the cable, slide the brass bullet weight on with the point towards the crimp on the cable. Now add two glass beads. Next slide a crimp on this end, followed by a swivel. Again take the cable back through the crimp and crimp like before.

Steel Leaders

The steel leader is made the same as the Carolina Clacker, but without the weight. For steel leaders some will prefer to use snap swivels instead of just swivels, you can use just snaps or any combination you prefer. On each end install the crimp and swivel or snap, and then bend the cable back through and crimp.

Carolina Clacker
Tie the swivel to the line going back to the rod with the bullet weight point towards the rod. Then tie some line to the other swivel and then a hook with a worm, lizard or other plastic bait.



Toilet Paper Roll – Leader Holder

By W. Jeff Farris, Missouri Sportfishing Team

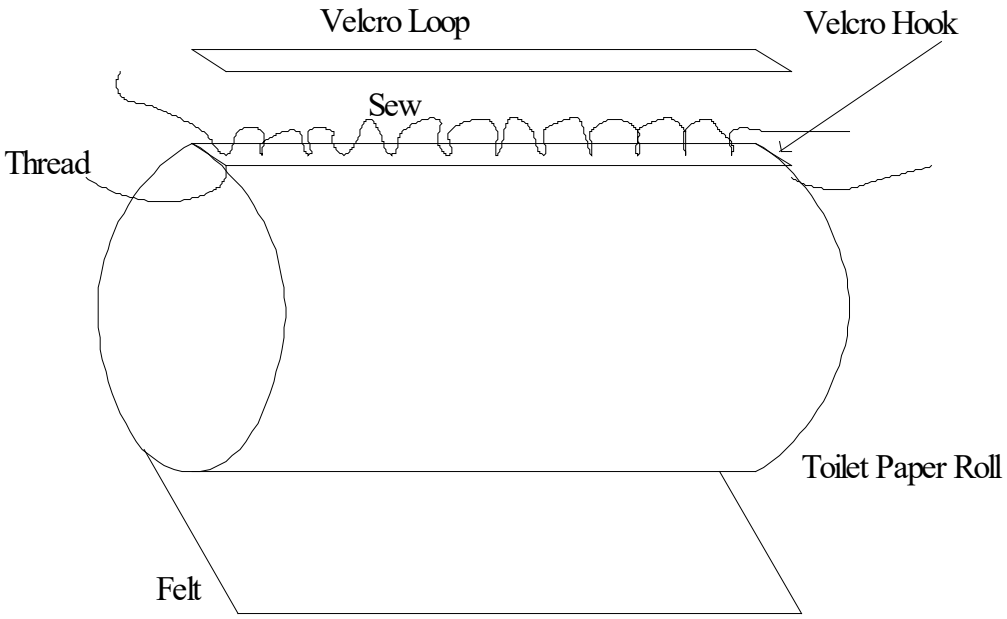
MATERIALS:
Card Board Toilet Paper roll
Craft Felt
Velcro (stitch on type)
Liquid Stitch
Stitch Awl with thread

ASSEMBY PROCEDURE:

Cut a piece of felt to fit the toilet paper roll. Glue the felt on the roll. At the seam sew on the hook half of the Velcro. Put the loop part on the Velcro.

To use

Stick the hooks of snelled hook or Crawler Harness into the felt and wrap the line around the roll securing in them with the Velcro.



Woodworking Projects for Sportfishing

Ronald A. Howard Jr.

Notes to the leader: This set of activities includes both simple and complex projects. You may elect to do one or more at any given time, but they should be selected to fit the skill and interest levels of the participants. Further, the degree of pre-preparation and tool use should be adjusted to the skill and training of the young people. Several of the simple projects could be pre-cut and simply assembled by younger youth. Others might involve 30 to 50 hours of work with hand and power tools, requiring considerable expenditure in materials. Finally, the projects should be selected for utility to the participants who are making them

Measuring Board
2-4 inch board cut to appropriate length dadoed to allow insertion of the yardstick
appropriate length of yardstick
stop block dadoed to fit the end of the board
waterproof glue
brass, aluminum or galvanized brads
sandpaper
shellac or varnish
paintbrush
paint thinner or denatured alcohol

Tilt
1x2 board cut 18 inches long
drill a 1/4 inch hole through the wide side 3/4 inch from one end
dado a centered slot 3-4 inches long in the end with the hole drilled in it
cut a 3/8 inch thick slice of wood about 14 inches long
round both ends
cut a 3/8 inch slot in the piece with a router
sink a light brad in one end of the narrow piece
paint the upper end of the flag a bright color (red is a good choice)
cut a 2 inch length of 1/4 inch dowel

Filleting Board
12 x 14 inch board
bevel or round over the edges
sand smooth and seal with salad bowl oil
optional - add a spring clip to hold the tails on one end

Priest or Billy Club
use 5/8 to 3/4 inch dowel
drill one end a couple inches deep with a 3/8 inch bit
fill the end with lead or cereban
round the weighted end
rasp the handle portion to provide a sure grip that fits the hand
leave a small swell at the handle end to maintain a sure grip
if desired drill a small hole through the grip to allow a thong to be passed through it
seal with varnish

Canoe Paddle
2x12 spruce
outline paddle shape on the plank
saw the outline with a band saw or saber saw
thin the shaft and blade portion to approximate thickness with a band saw or disk sander
use a rasp or sureform plane to finish roughing out the shape
sand to final shape and smoothness
varnish the shaft and blade with spar varnish, sanding lightly between coats
rub linseed oil into the handle portion of the paddle

Wooden Plugs
shape with a lathe, rasp or knife and files
sand smooth, dampen and allow to dry, and repeat
apply a sanding sealer
sand smooth again
drill pilot holes for screws and screw eyes
insert toothpicks in each hole
apply a base coat of white or neutral paint
sand lightly
apply the foundation paint color(s)
apply accent color(s)
apply a clear epoxy over the finish coat
install screw eyes, hook hangers, split rings and hooks

Other Ideas

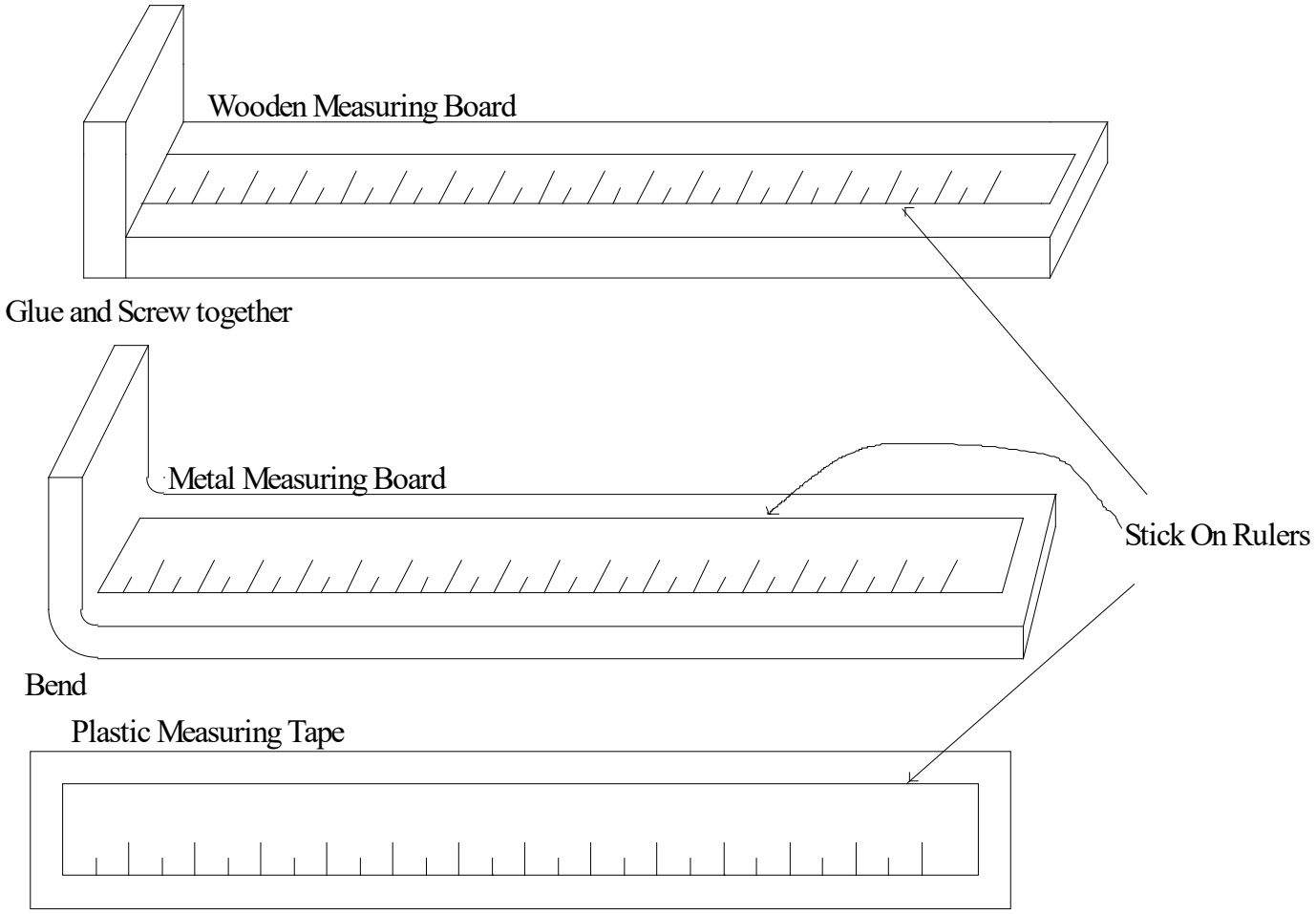
Tackle Locker	Trout Net Frame	Reel Box
Rod Rack	Reel Repair Tray	Gaff
Fly Tying Tray	Fly Tying Kit Box	Tackle Cabinet
Fly Tying Table and Cabinet	Display Box or Rack	Marker Buoy
Jig or Lure Drying Rack	Ice Fishing Sled	Wading Sled

Making a Fish Measuring Board/Tape

W. Jeff Farris, Missouri Sportfishing Team

Measuring tapes are used to measure the length of the fish caught. Buying these measuring sticks can get costly. An alternative is to make one. These make a great project for youth.

MEASURING TAPES
Find an adhesive backed measuring tape such as the ones available (free) from the Missouri Department of Conservation. A variety of materials may be used in building measuring board. Options include wood, aluminum, plastic, fiberglass, etc. Be creative

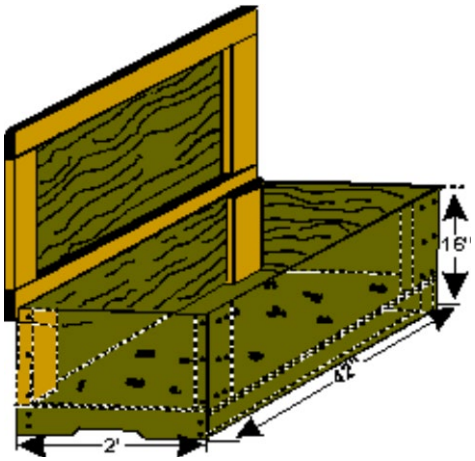


The best measuring devices have a "right angle" or vertical piece at one end of the board as seen in the two illustrations above. This allows the nose of the fish to be bumped up against the short side and then measured.
A wooden board can be done with 1 inch lumber of good quality. Make good sharp 90 degree. Glue and screw the two pieces together. Place the zero mark of the tape flush against the angled end.

For aluminum or other metal, cut a piece a few inches longer then your tape and bend the metal at this length of the tape. This allows you to bump the fish on the short side and measure down the long side. The angle must be 90 degrees – no larger. These measuring boards work great, but because of the angled piece they take up a lot of space.

Plastic can be used to make a measure and does not have the angled piece. Locate thin plastic "Dry Erase" sheets at the craft store. Cut the plastic in strips, rough up the surface with sandpaper to help the tape stick better. Mount the tape to the plastic. One sheet will make about 15 tape measures. These tapes can be rolled up and the kids can put them into their tackle boxes.

Building a Worm Box



Materials:
1- 1/2" treated sheet of plywood
1- 12 foot 2x4
1- 16 foot 2x4
2 lbs. 6d galvanized nails
1/2 lb. 16d galvanized nails
2 galvanized door hinges

Tools:
Tape measure, skill saw or rip hand saw, hammer, saw horses, long straight edge or chalk snap line, screwdriver, drill with 1/2" bit. Use eye and ear protection.

Measure and cut plywood as indicated in drawing above. Cut the 12 foot 2x4 into five pieces: two 39", two 23", and one 20" long. Nail the 2x4s together on edge with two 16d nails at each joint, as illustrated in the Base Frame diagram. Nail the plywood base piece onto the 2x4 frame.

Cut four 1-foot length out of the 16 foot 2x4. Take each plywood side piece and place a one foot 2x4 under each of its end so that the 2x5 is flush with the top sides of the plywood, and nail the boards into place. Nail the side pieces onto the base frame. To complete the box, nail the ends onto the base and sides. To reinforce the box, make sure there is a nail staggered at least every 3 inches wherever plywood and 2/4 meet. Drill twelve 3/16" holes through the bottom of the box for drainage.

To build the lid, take the remaining 12 foot 2x4 and cut it into two 45" pieces and two 20" pieces and lay them flat, short pieces on the inside, as indicated in diagram above, so that the plywood top is inset from the edges of the 2x4 by 1 1/2" all the way around the perimeter. Nail the plywood onto the 2x4 securely. Place the hinges on the backside of the box at both ends on the 2x4s and on the underside of the 2x4 lid frame, so that the lid will stand upright when opened.

During the winter, worm bins should be kept in a cool indoor space, such as a basement or warm garage, to avoid freezing. Bins may be placed in a shady outdoor space the remainder of the year. This bin can be built for about $35.00, with new wood and hardware, or less using recycled materials. Worm bins can also be made from wooden boxes or other containers. Any worm bin must have drainage in the bottom and a tight fitting lid to keep moisture in and pests out.

Home-made Bait Recipes

Gerry Snapp. MO 4-H State Specialist (retired)

Just as kids love to catch a fish on a lure or jig that they made their self; they also get a kick out of catching fish on home-made bait. Catfish or carp or the two main candidates for these home-made bait recipes. There are literally hundreds of bait recipes used by fisherman. Many of the catfish bait recipes, called "stink" baits or blood baits, are made with all kinds of smelly ingredients. Carp bait is usually milder and usually has a "sweet" base.

Listed below are just a few samples of relatively mild bait recipes. As the 4-H member becomes more interested and more proficient in using home-made baits, they may want to experiment with others. That's great, just make sure they get mom's okay before they start mixing up whatever recipe they choose.

CATFISH

Kool-Aid Hot Dog Chunks

Ingredients:

Hot dogs
Strawberry Kool-Aid (2 pkgs, unsweetened)
Garlic Cloves (several, 3-5)

Instructions:

1. Slice several hot dogs into 1 inch pieces and place them in a glass jar w/lid (apprx 1 qt)
2. Add the 2 packages of Kool-Aid and the garlic Cloves. Fill the jar with water and let marinate overnight.
3. Run a hook through a chunk of hot dog with the barb exposed, and you're read to go. Good for channel cats, blue cats, and bull heads.

Experiment: Try Grape flavored Kool-Aid (unsweetened) or cheese hot dogs (hot dogs with bits of cheese in the dog)

Dough Balls

Ingredients:

½ cup of flour
½ cup of cornmeal
¼ cup (or more) Parmesan cheese
2 T garlic powder

Instructions:

1. Mix ingredients together
2. Add enough water to make mixture sticky
3. Roll into balls and pinch around treble hooks

CARP

Dough Bait

Ingredients:

1 ¼ C flour
1 ½ C yellow cornmeal
2 T sugar
1 tsp salt
1 ½ C water
1 small pkg strawberry gelatin
1 T vanilla

Instructions:

1. Mix flour, cornmeal, sugar, and salt together. Set aside.
2. Boil 1-1/2 cups water; turn heat down to simmer. Add 1 small package strawberry gelatin, 1 tablespoon vanilla, stir.
3. Using a wooden spoon, add dry ingredient mixture on top of the gelatin water until surface is covered.
4. When the water bubbles up through the dry mixture, continue adding mixture stir dough or take out of pan and knead for two minutes. (Be careful because mixture will be hot!)
5. Dough bait will be very stiff. Store in refrigerator in plastic bag until ready to use.

Gerry's Sweet Dough Bait

Ingredients

½ cup Corn Syrup (or any kind)
½ cup peanut butter
½ cup brown sugar
1 tsp of cinnamon
Wheaties (2-3 cups) enough for right consistency

Instructions:

1. Begin with 2 cups of Wheaties,
2. Add corn syrup and mix by hand
3. add other ingredients and continue to mix and knead
4. Add Wheaties as needed to reach a firm consistency
5. Store in plastic tub with lid
6. Roll into small ball and load onto treble hook

Corny Dough Bait

Ingredients

1 cup of water
1 cup corn meal
1 cup flour
1 can creamed corn

Instructions:

Add 1 cup of boiling water to corn meal in a mixing bowl. Slowly stir as water cools. Add flour and continue mixing. Add can of creamed corn. Knead, adding flour as needed for appropriate dough bait consistency. Store in ziploc bags after cooling

Designer Carp Bait (credit to Darren Takenaga)

Carp fishing is very popular. With the popularity, derives various bait formulas for catching carp. Although there are a limitless variety of baits, each one can be broken down to a few essential ingredients.

To make a winning carp bait, one only needs a base (something that holds all the ingredients together), a liquid (mixed with the base to form the mixture) and an attractant (the ingredient that actually brings the fish to the hook). When making your own bait, consider using one base, one liquid, and up to 3 attractants.

Bases – the stuff that adds volume to the bait

- Cereal - Popular cereals include corn puffs, wheat flakes, corn flakes
- Corn Meal – great base. Corn is also a form of attractant
- Flour – powder form or bread products
- Instant mashed potatoes – dry

Attractants

- Flavored gelatin powder – cherry and strawberry are popular
- Canned corn or creamed can corn – carp like corn
- Frozen or fresh corn kernels – sometimes just using the kernels on the hook is all that is needed to catch the big one
- Sugar – carp like sweet stuff
- Vanilla extract – smells good to humans, evidently to carp too
- Marshmallows – can add a little buoyancy to the bait

Liquids – not many, but essential in keeping all the ingredients together

- Water
- Juices from canned corn
- Sodas – strawberry or grape most popular

Remember to write down every measurement and ingredient because a depressing realization is that you are catching your limit and don't know how to remake the bait.