

HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

By: Bob Church
a.k.a.

>>—Straight Arrow—>

Introduction: This tutorial is intended for use by the Mesa District Varsity Scouts and Leaders who are preparing to attend the **Mogollon Mountain Man Rendezvous** held biannually at Camp R-C on Christopher Creek East of Payson, Arizona.

Here I will attempt to explain a fairly simple procedure to build a nice knife and leather sheath that can be worn with pride with your Mountain Man Regalia at the coming Rendezvous. In doing so, I want to give credit to my good friend and mentor “**Trader Joe**” **Mortensen**, who taught me the basics of knife making and encouraged me over many years until his death immediately following our last Rendezvous in 2009. He is sorely missed and will always be an inspiration to all who knew him, especially to all of the hundreds of Varsity Scouts who came to his shop to build knives and then came to trade with him on his “Trading Blanket” at numerous Rendezvous over the years.

A word of caution is also required: **These knives are not intended to, and should not, be used at other Scout functions, other than at the Rendezvous as a part of your regalia.**

How to Make A Knife.

Blades: We will start with a ready made knife blank which can be obtained from a variety of sources. The blades I use come from **Lisa and Bob Trenter in Mesa. They have a large variety to choose from and their prices are better than any I have found anywhere. Cell Phone: 480-200-0151 or Home: 480-655-8852.**

The blade chosen most often by the Scouts is one of several **6 inch models** made from **stainless steel** with a built in **brass finger guard**. They have a **narrow tang** that will fit in a small hole drilled in the antler handle. Leaders will often choose a longer and bigger blade, which better fits their self-image, I guess.

It is also possible to make your own blade from used lawn mower or concrete saw blades and that is a good way to do it, but I have found that in practice it generally takes a lot more time to do so than most Scouts have available in their busy schedules. I have a whole box full of unfinished blades that accumulated over the years before I discovered Lisa and Bob.

Handles: You also need to obtain a piece of **deer or elk antler** for use as a handle. These are available from commercial knife suppliers but we have found that you just have to inquire of family members and friends who are hunters and they are happy to share some antler with you.

The size of antler should be proportionate to the size of the blade you choose and should fit your hand comfortably. Typically, this means a piece of antler that is about 4-5 inches long and no more than about 1 inch in diameter where it attaches to the antler. You should choose a size such that the knife and handle are balanced at the point where handle and blade come together.



HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

Step 1: Before you operate any power equipment, please be sure and wear gloves and eye protection.

Step 2: Begin by cutting off the tang on the blade to about 2" in length. This is about the length of your typical drill bit.

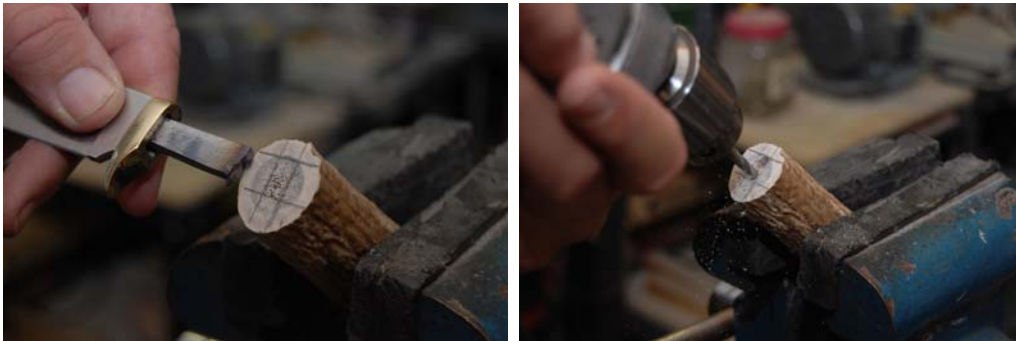
For this process, you can use a **hack saw** or other **metal cutting saw or grinder**. I use a 4 ½" angle grinder with a metal cutting wheel. (picture 034)



Step 3: Drill a hole in the antler handle. For this you will need a vise with padded jaws and a power drill. For most of the 6" blades a **5/32" or 3/16"** bit works pretty well. Don't make the hole any bigger than necessary.

Mark the shape of the tang on the end of the antler. (Picture 036 or 037)

Step 4: Shape the antler to fit the blade.



Begin by marking the shape of the guard on the face of the antler. (Picture 044)

Then sand the antler down to fit the guard. To do this I use a series of **belt sanders** beginning with 30-50 grit belts for the initial rough shaping, then to 80-100 grit for the fine fit, then to 200+ grit for final finishing and removing any sanding marks. (Picture 056) Also make sure that the face of the antler fits perfectly against the guard without any gaps. (Picture 045, 049, 052)



HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

After the antler is shaped it needs to be polished. For this I use a **buffer wheel** and some **white buffing compound** to give the antler a nice shine. (Picture 058, 059,061)

The blade and brass guard also need to be polished using a different buffing wheel and buffing compound. Don't buff both antler and metal blade on the same wheel as the metal will turn the wheel black. Using this wheel for the antler will turn it black, which is difficult to clean up.



Step 5: Attach the antler handle to the blade.

Using your **padded vise**, place the antler in the vise with the hole facing up.

Mix a two part epoxy in sufficient quantity to completely fill the hole in the antler, making sure that any air bubbles are allowed to come to the surface.

For this I use a **5 minute epoxy** which can be obtained from Home Depot, Lowes or Ace Hardware. There are other longer curing epoxies that will work just as well, (and some claim that they will make a stronger bond) but the 5 minute variety has worked well for our purposes and saves a lot of time.

I mix the epoxy on a scratch pad and use a small metal paddle I found at a knife show to mix and apply it.



A popsicle stick works just as well. Just be careful and don't get any more glue on the handle and blade than absolutely necessary and be sure and clean it up before it is allowed to dry using **paper towels and Goof Off cleaner**. A strip of blue masking tape around the end will also prevent excess glue from getting on the handle.



When the hole is completely filled with epoxy and any air bubbles are removed push the tang down into the hole and wipe away any glue that is squeezed out with a paper towel and Goof Off.

HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

I also use a **bar clamp** to hold the blade and antler tightly together when I can do so and keep them straight. Sometimes this is not possible due to the irregular shape of some of the antler. In that case you just have to hold the blade in place for a couple of minutes while the epoxy sets up. Just leave everything in place for at least 5 minutes before removing the knife from the vise.

Your knife is now finished, unless you wish to add some decoration to the handle, but that is entirely a matter of personal preference. You now have a functional knife.

At this point, as time permits, it would be good to spend a few minutes with a good sharpener system. A dull knife is a dangerous thing to have around.

How to Make a Leather Sheath:

For this purpose, there are many possibilities, both in the style of sheath and the materials to make it with. These can be as simple or ornate as time, money and patience permit. There are two basic styles that I have found work best for the style and size of the blades we use. Both are **pouch or deep pocket type sheaths**, but are made of different materials and utilize different finishes. I will only describe one of those in these instructions. The other will be described elsewhere.

The best source I have found for the leather materials and needed leather working tools is at **Tandy Leather, which is located at 1932 E. University Dr., Tempe, AZ 85281. Phone: 480-966-4151.** Be sure and tell them that you are Varsity Scouts and they will give you a nice discount.



Pouch Sheath:

Step 1: Make a stiff leather core which will protect the blade and stiffen up the sheath.

Begin by tracing the outline of the blade, beginning at the point where the blade meets the guard, on a stiff piece of **vegetable tanned leather** that is about the same thickness as the blade. (Do not use chrome tanned leather as it will tend to tarnish the blade while in the sheath). Then scribe an outline about 1/4" to 5/16" wide all around the edge of the blade.

Using the outline as a pattern, cut out 3 pieces of leather to that size. On one of these pieces trace the pattern of the blade on the leather, then cut out a piece that will be the same size as the blade. The narrow strip remaining that outlines the blade is called the welt. It is important, for all of the cutting and punching operations described below, to use some sort of a rubber or plastic cutting board, available at Tandy or at craft stores as are all the tools and materials needed.

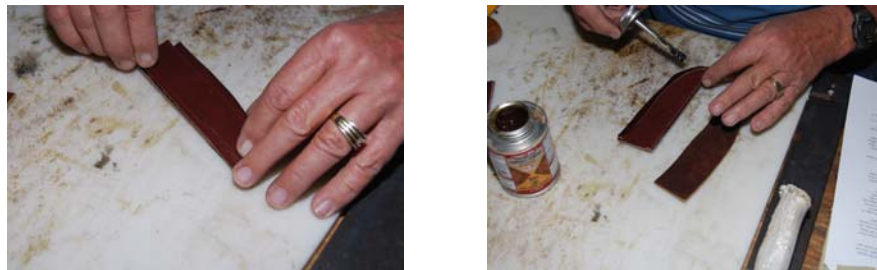
HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

Now using **Contact Cement** apply a small amount to the welt and a small amount to the edge of one of the other pieces. (Be sure that you apply it to the side that will match the welt and be careful not to get glue on the center



area where the blade would touch it. The glue will corrode the blade.) Then after allowing the cement to dry to the point where it is slightly tacky, attach the welt to the piece that you have applied the glue to. For this process I lay the piece that is the shape of the blade that was cut out and lay it in the center, then attach the welt so that it fits around the edge. This assures that the resulting space left in the middle will fit the blade.

Now apply cement to the top of the welt and to the edge of the top piece and fit them together forming a pocket that the blade will slide into, which will protect the blade and prevent it from cutting the stitching on the sheath and possibly from injuring you in the event of a fall or other accident. It also stiffens up the sheath.



Now trim all the edges so they line up. Then round off edges using a **skiver**. This operation could also be done on the belt sander. This is important to make sure that the sheath cover will fit properly.

When you are finished the blade should fit nicely inside the core.



HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

Step 2: Make a pattern for the sheath cover.

For this I use a **standard file folder**. Begin by folding the paper along a center line. Then insert the blade and core into the fold with the back of the blade facing the fold.

Lay the folded paper, with the knife and core pressed against the fold, flat on the table. While holding the knife in place trace the outline of the blade and handle on one side of the paper, then roll the whole thing over and repeat for the other side of the knife. Then scribe another line about ½" wide around the outside of the core, which will provide space for lacing and trim around the edge of the sheath.

Extend the lines on both sides about 4" longer than the blade and guard and draw a perpendicular line across to connect the two sides. This is the pattern for the sheath cover leather.

You will also need to cut out a small piece of leather for the belt loop. This should be about 1 ½" wide and long enough to accommodate the width of the belt that you wear with your regalia. Normally this will be about 2-3" wide. Make your loop piece about ¾" longer than the width of your belt.



Step 3: Cut out the leather material for the sheath cover and belt loop.

For this material I use one of several colors of what they call "**Oil Tanned Utility Sides**" leather at Tandy. They have nearly black and several shades of brown. The boys choose which color they like. It is flexible, light weight and is pre-finished so you don't have to worry about applying stains and other finishing materials. Those processes can consume a lot of time which would be required for drying and finishing.

When you are marking the pattern on the cover material, be careful not to leave marks that will be visible after the sheath is assembled. For this I use a **scratch awl**. A pen or pencil are OK as long as you are careful not to use them where the marks will be visible on the finished sheath. They are unsightly and difficult to remove. Cut out the cover material and belt loop using the patterns. Use a straight edge to make sure the edges and corners are straight and square.

I use a pair of **leather shears** and have found a **rotary cutter** to be a great help in cutting straight lines. An X-Acto knife would also work well.



HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

Step 4: Begin the assembly by first laying the leather cover with the finished side out and mark two lines at what will be the top edge of the sheath. The first at 1 ½" below the top and the second 3" below. If your leather is somewhat stiff, it may be helpful to cut a small crease at the 1½" line, which will help make a tighter fold.

Apply cement to the area above the 3" line. Be careful that you don't get any glue below the line. After it dries sufficiently, fold the top edge over to the 3" line.



Step 5: Attach the belt loop to the sheath cover.

Place the top end of the belt loop upside down just to the right of the center of the cover for right hand placement or to the left of center for a left hander, just below the edge of the folded over section. .

To attach the belt loop punch two 3/32" holes for rivets. The rivets should be no longer than needed for the double thickness of the leather. For the leather we are using this would require the use of the **Extra Small Rapid Rivet**. The rivets are available in several lengths and in brass, silver and black colors. The choice of color is up to the boys. For this operation, you also will need a **small mallet** and an **anvil** or other hard surface to pound on. For an anvil I have a piece of iron bar about 3" wide and ½" thick and about 8" long that I keep on my work table for this purpose.

Attach the rivets to the top of the loop, then fold the loop over and attach with two rivets at the bottom edge. This leaves a small space at the top of the loop to accommodate the belt. You may prefer to attach the belt loop by stitching with artificial sinew using a saddle stitch. This stitch will be discussed when describing the other style of sheath mentioned above. The rivets are just a lot quicker.

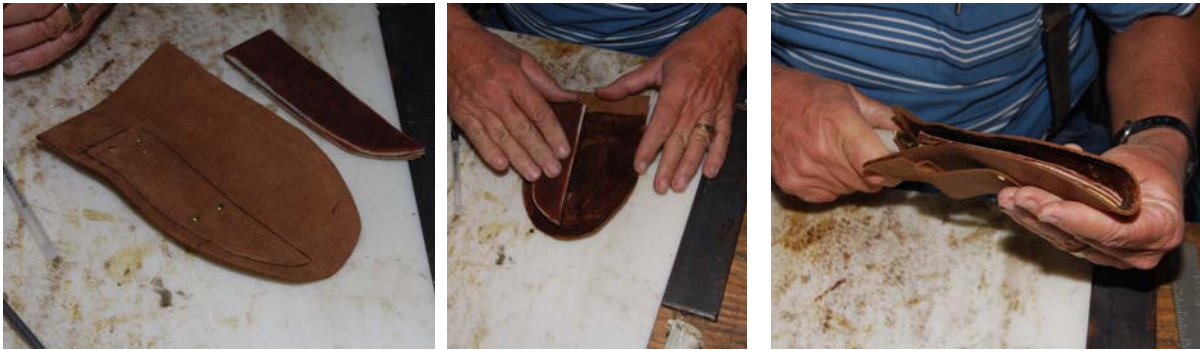


HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH

Step 6: Cement the whole thing together.

Begin by placing the knife with the core on the inside of the cover and fold the cover over. Make sure the edges line up properly and that the top corners are aligned and square. Mark the location of the core on the inside of the cover.

Apply contact cement to $\frac{1}{2}$ of the inside area of the cover and to the matching side of core. Then carefully lay the core in the area previously marked. To test the fit fold the other half of the cover over and again make sure that the edges line up. When you are satisfied that they fit then apply glue to the remainder of the inside of the cover and to the top of the core and fold the cover over to completely secure it in place and form the pouch. The top of the core should now be about $1\frac{1}{2}$ " from the top edge of the pouch.



Step 7: Lace up the edge of the sheath cover.

Beginning at the tip of the cover with the front facing you, mark a line along the edge of the core. Following this line punch a series of holes for the lace. For this purpose I use a **3 prong buck stitch chisel punch** which makes $\frac{5}{32}$ " wide slits laid at an angle about $\frac{1}{8}$ " apart.

For the lacing I use **deerskin lace**. The lace is $\frac{5}{32}$ " wide and comes in 50' rolls in either black or gold color. Here again, the boys choose the color they want.

For this operation it is also helpful to have a **pointed scratch awl** or an ice pick, which is used to open the holes for the lacing needle, and a small pair of **needle nose pliers**, which help in pulling the needle through the hole. The needle is called a **Perma-lock** and is about 2" long with a threaded hole in the end for the lace. You cut a point on the end of the lace and simply screw it into the hole as tightly as you can.



HOW TO MAKE A DEER OR ELK ANTLER HANDLED KNIFE AND LEATHER SHEATH



We use what is called a **whip stitch**, which is essentially a spiral where the lace is put through the leather from the front then wrapped around and back into the next hole from the front. The whip stitch uses about $3 \frac{1}{2}$ - 4 times the length of the project. For the 6" knife sheath, this means you will need about $2 \frac{3}{4}$ feet of lace.

Begin by inserting the awl between the two layers of the cover at the tip of the sheath and pushing it through the first hole from the inside towards the back of the sheath. Insert the needle with the lace and pull it through until about $\frac{3}{4}$ " remains. Then with the needle nose pliers tuck the tip back in between the two layers of the cover at the point where it is folded. Then wrap the lace around the fold and back through the first hole again. Continue by wrapping the lace around the edge of two layers and back again through the first hole. This securely locks the end of the lace inside and provides a nice square appearance.



Continue by wrapping the lace around and back through each succeeding hole to the end of the sheath. Be sure that you keep the lace straight such that the finished side of the lace is always facing out. If it becomes twisted, use the needle nose pliers to twist it straight before you pull it tight, which you need to do after each loop. Continue until you reach the last hole just below the guard. For this last loop wrap the lace around and insert it back again into the last hole. This gives it the same square look that you started with, then bring the lace around one last time. This time insert the awl under three or four of the last loops you made, in-between the two layers, if you can, then insert the needle and lace under the loops and pull it tight, then cut it closely so the end does not stick out. The lacing and the sheath are now finished.

