

# Chip Carving a Reef Fish



Power carve a realistically shaped fish and embellish it with chip carving

By Bill Johnson

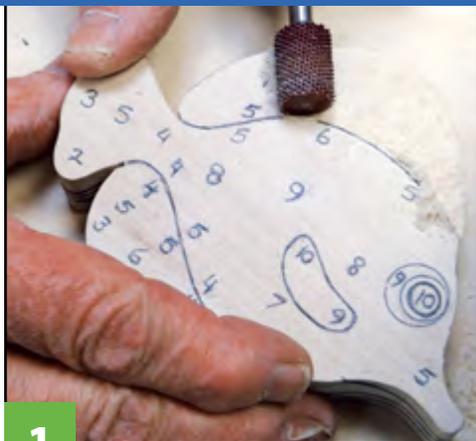
I've carved a number of aquatic animals and embellished them with chip carving, but this yellow tang (a member of the surgeonfish family) makes a great first project. The fish is only 5" long, with beautiful flowing lines and a side profile that provides plenty of space for chip carving. The fins are small enough that you can carve them as a part of the fish, so you don't need to attach them later. Finally, the shape of the fish makes it easy to carve as a wall display, so you only need to chip carve one side.

I think of myself as a chip carver and see this project as a chip carving how-to project. But, you need to shape the fish properly before you can chip carve, so the first half of this article explains how I carved the fish from a block of basswood. Then, we will embellish the fish with some simple chip-carved patterns.

## Getting Started

Make a template from sturdy, flexible material, like an index card or photo paper. Cut the dashed lines wide enough to fit a pencil or marker through. Cut the eye and pectoral fin. Trace the outline and interior lines onto the blank. Transfer the elevation numbers to the blank. These numbers show how much wood to remove in different areas (as on a topographical map). In the areas marked 10, no wood is removed. In the areas marked 2, nearly all of the wood is removed. The numbers are all approximate and relative to one another, and do not represent any particular unit of measurement. Mark the side edges to show where the front and back meet and the shapes of the fins. Keep in mind that my blank was  $1\frac{3}{16}$ " (20mm) thick, so if your stock is thicker or thinner, make adjustments from the back surface of the blank.

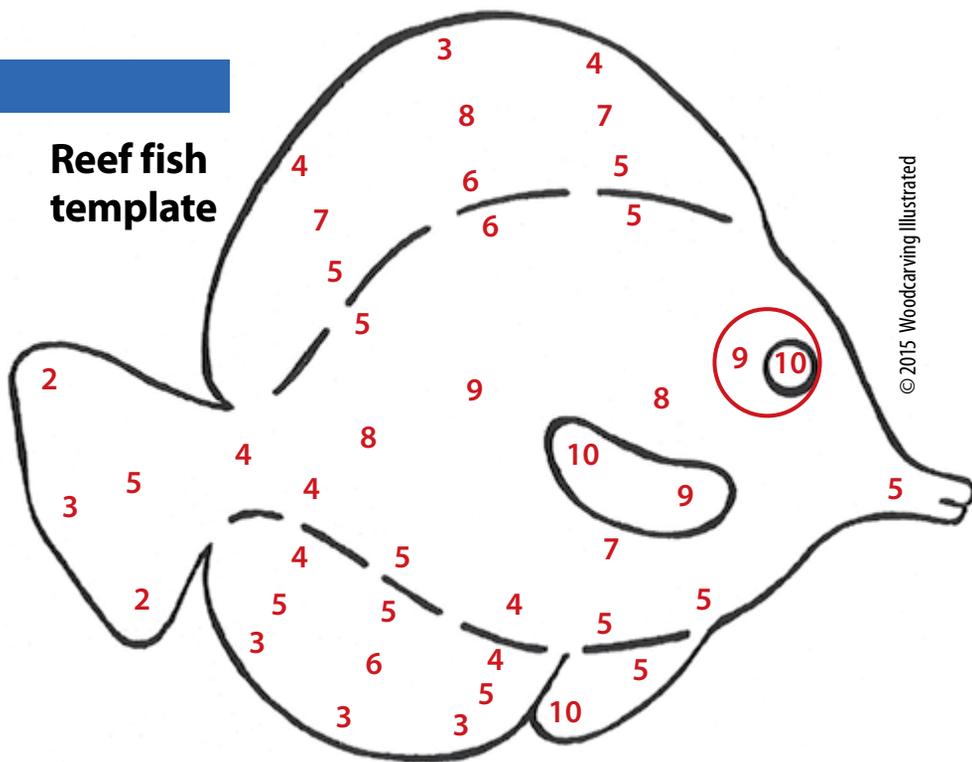
## REEF FISH: SHAPING THE FISH



1

**Carve the dorsal fin.** I use a safe-end cylinder-shaped carbide-point bit. Remove wood from the dorsal fin, forming a flat surface about ¼" (6mm) from the top surface. I call this elevation 8. Rewrite the elevation guides on the wood.

### Reef fish template



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2

**Carve the remaining fins.** Shape the anal and tail fins. For the pelvic fin, use a small sanding drum to remove wood from the body section, starting at the line between the body and the pelvic fin. Take this area down to elevation 5 (lower than the dorsal fin) to provide room to work. Then, finish roughing out the pelvic fin, which should start at elevation 5 near the body and curve up and out to the tip of the fin (elevation 10). Refer to the lines you drew on the sides for depth.



3

**Shape the body closest to the fins.** Hold the sanding drum at a high angle as you shape the body right next to the fins. At this stage, do not sculpt the rest of the body any more than necessary to shape the places where the body meets the fin. Use a soft bristle brush to remove any wood fuzz or sanding dust.



4

**Finish carving the fish.** Reestablish the elevation guide numbers and landmark lines, and then sculpt the front and back of the fish in stages. Be sure to maintain the relative elevations and check your progress often. Stop power sanding before you reach the final elevations; you will remove additional wood by hand sanding the surface smooth.



5

**Sand everything smooth.** Hand-sand the piece with fine-grit sandpaper to remove any scratches or tool marks. Maintain the different elevations. Be careful smoothing the fragile pelvic fin. Fine-tune the front and back surfaces so all of the fins form sharp edges where the front and back surfaces meet.

## Chip Carving on a Curved Surface

Grain direction is important to all woodcarvers, of course. Chip carving on changing concave and convex surfaces requires an extra degree of caution because the grain also runs in and out relative to the surface—much more so than normal. At times you will need to reconsider the angle and direction of the knife blade. This can even occur when cutting simple two-sided chips like the leaflets of the compound walnut leaf (Step 7). Problems frequently occur when cutting three-sided chips, like those on the fish's body. When I started to cut one of the diagonal sides, my knife blade was causing the wood on top of it to break free part-way into the area next to it, where I didn't want to remove anything. I adjusted, making the bottom cross-grain cut first (for several rows), and had no further problems. Be aware of this potential throughout the project. Also, note that in some steps, the angle of my knife relative to the wood surface appears to be extremely low. That's mostly due to the angle of the photo and the curvature of the surface.

When chip carving, I switch to metric because the math is easier. I prefer to lay out chip carving patterns for aquatic animals in sections, which provides flexibility if I need to adjust portions of the pattern for any reason. It also reduces the smudging that can occur if my hands rub against a fully penciled-in pattern.

### TIP

#### FLEXIBLE RULERS

*To mark the 4mm squares on the body section, I use strips of metric graph paper or plain paper marked every 4mm with an accurate ruler. Use clear tape or self-adhesive clear plastic laminate to cover both sides of the ruler. For this fish, I use one that is 120mm long by 10mm wide.*



8

**Carve the ends of the central stem.** Making shallow cuts, carve the central stem at the lower end of the compound leaf, starting slightly above the bottom pair of leaflets. If you prefer to carve the entire central stem, be sure you leave space between it and the leaflets and avoid letting the two cuts touch. Use a soft rubber eraser to remove any remaining pencil marks.

## REEF FISH: ADDING THE CHIP CARVING



6

**Draw the chip-carving pattern on the dorsal and anal fins.** Start with the central stalk. Widen it into a graceful three-sided stem at the end. I use the central stalk line for reference only. Draw canoe-shaped leaves on each side of this line, leaving .5 to 1mm between each leaflet and the central stalk, which you will erase later.



7

**Carve the leaflets on the compound walnut leaves.** Using a chip-carving knife, cut standard two-sided chips for the leaflets. You can cut one leaflet at a time or cut one side of each leaflet along a whole row, and then come back to cut the other side. This is normally a very simple cut, but due to the curved surface, your knife may want to run with grain you can't see.



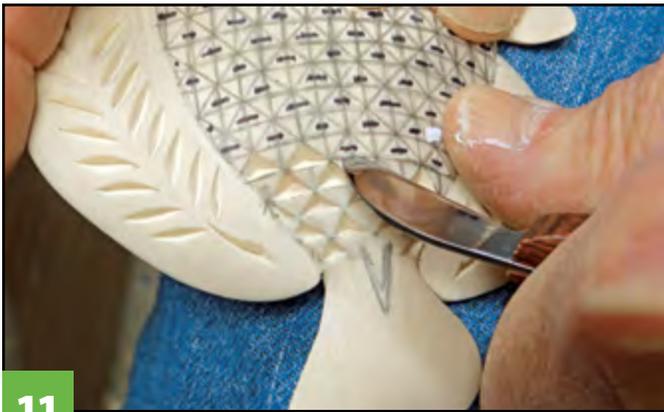
9

**Draw a grid onto the body.** Draw a horizontal line that starts 16mm from the mouth, gently curves over the pectoral fin, and ends at the base of the tail. Place marks every 4mm from the beginning to the end of this line. Draw a curved vertical line intersecting the first line at a mark near its middle and, from that point, add marks every 4mm in both directions. Repeat the process with a vertical row of marks (not lines) passing through the marks in the horizontal line every 12mm. Draw a new horizontal line 12mm above the first line, connecting the vertical marks. Repeat the process below the centerline. Then, draw horizontal lines as needed to complete the grid of 4mm squares on the body.



10

**Complete the body pattern.** Draw diagonal lines to turn the squares into triangles in both directions. Then, mark the chips to remove. You will be removing the triangular three-sided chips in alternating rows. Mark all of the triangular chips that point toward the head. Leave the chips pointing toward the tail; this creates an abstract impression of scales. (You can see the spots I marked incorrectly and had to remove with white-out.)



11

**Carve the chips on the body.** In my case, it worked out with a chip on each side of the “scalpel.” Take your time with the three-sided chips, and pay close attention to grain direction and the wood stability due to the ever-changing surface height and grain changes relative to the surface. Position the knife so all three cuts will meet in the center of the triangle to free the chip.

## Tail Spine

You might have noticed that a new appendage appeared at the base of the tail. The yellow tang has a scalpel-like spine at the base of its tail, which gives the surgeonfish family its common name. The blades on each side of the body are modified scales. Each fits into a slot, but can be exposed when the fish flexes its tail. The blades are used both as defense from predators and to ward off competitors for feeding or shelter areas. To carve it, I first draw a double “V” as you see in Photo 11. Rather than make two shallow cuts toward each other from each side of the two “V” lines (as we normally would), I make a fairly steep cut along the inside lines, away from the outer “V”, slightly undercutting the inner space. Then, I make a shallower cut from the outer line toward the inner “V”. The wood comes out, leaving the impression of a sharp object lying on the surface of the fish.



12

**Erase the pencil marks and smudges.** Use a soft non-latex rubber eraser to remove pencil marks and smudges. To remove more difficult marks, use an ink eraser, but be careful—they contain small amounts of grit like sandpaper. Rub lightly so you don’t break out any fragile chips or scratch the wood. If you plan to paint (or stain) your piece, a few pencil marks won’t hurt.



13

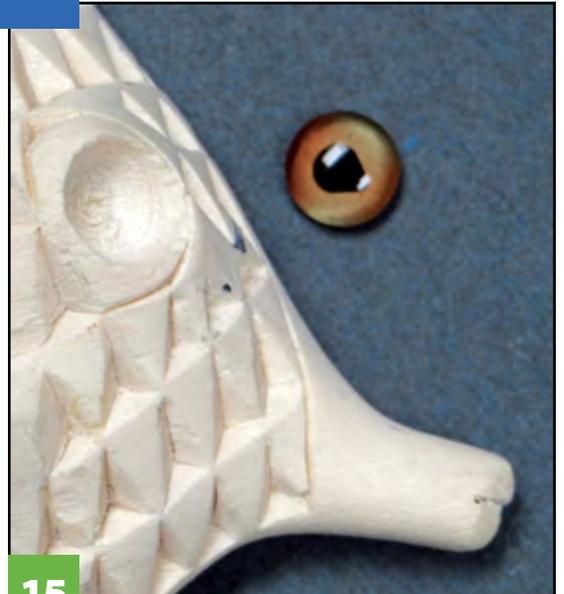
### Carve the remaining patterns.

Use a technique similar to Steps 6 and 7 to carve the vines on the pectoral and pelvic fins. On the tail, carve a thin circle around the outside of the flower petals and another around the center, and then carve along all four dividing lines, stopping short of the center circle. Carve four small, curved triangles where the dividing lines meet the petal edges and circle. Then, carve away the wood up to the petals, forming a deeply relieved oval around the flower so it stands out from the tail. Use a stab knife to add detail marks to each petal.



14

**Drill the eye hole.** At the center of the eye location, drill a 1/8" (3mm)-diameter by 1/8" (3mm)-deep starter hole. This prevents the bit from skidding across the surface of the carving. Sometimes, I cover the area around the eye with masking tape for additional protection. Chuck an 8mm ball-shaped burr into a rotary tool, bring it up to speed, and press the tool into the wood, centered on the starter hole. Stop to check the depth and angle. The eye socket should be angled about 45° off the back surface.



15

**Insert the glass eye.** Mix a small amount of two-part epoxy putty, and pinch off enough to create a 3/16" (5mm)-diameter ball. Place the epoxy putty in the eye socket and press the glass eye into place. If no putty squeezes out, remove the eye, add a tiny bit more putty, and press the eye into place. Remove the squeeze out before it cures.

## materials & tools

### MATERIALS:

- Basswood, 1 3/16" (20mm) thick: 4 1/2" x 5 1/2" (114mm x 140mm)
- Index card
- Sandpaper
- 2-part epoxy putty
- Glass eye, 8mm dia.: Van Dyke #SWDP8 Painted Dolphin
- Acrylic paints compatible with airbrush: green, orange, pearlescent white, yellow-orange, red
- Acrylic finish: clear
- Cherry burl or other base
- Boiled linseed oil
- Brass tubing, telescoping square: 1" (25mm)
- Spray lacquer
- Hangers

### TOOLS:

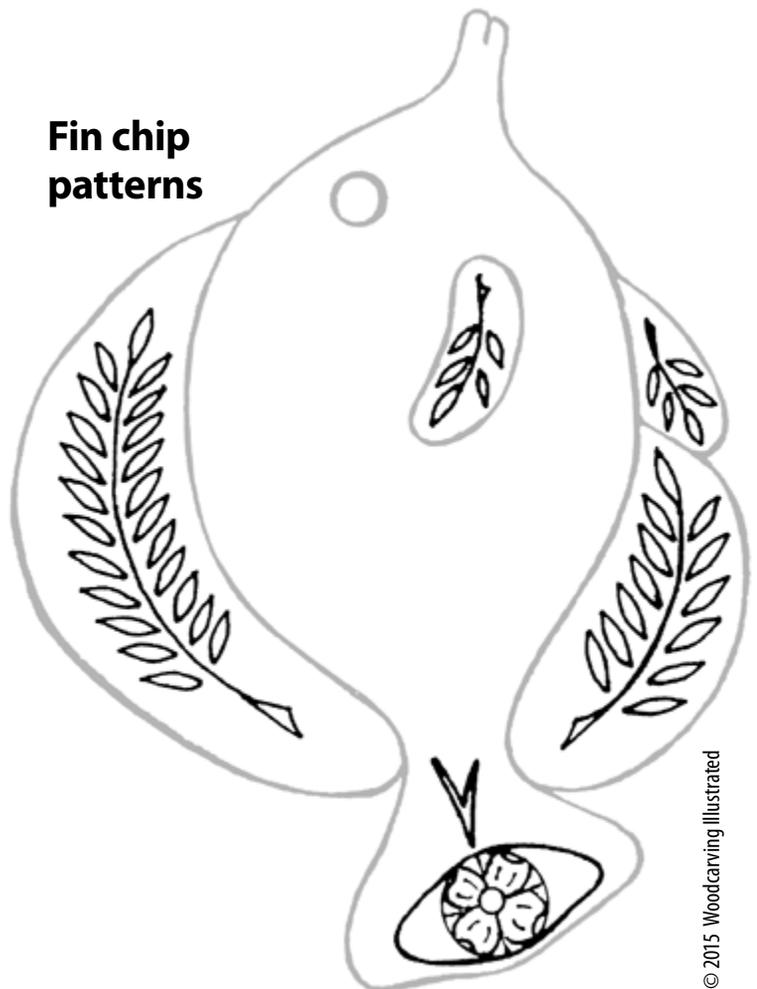
- Pencil
- Shop-made 4mm increment ruler
- Permanent pen
- White out (optional)
- Rotary tool with bits: safe-end cylinder-shaped coarse-grit carbide-point bit, 8mm ball-shaped carbide point bit, long-tapered coarse-grit carbide point bit, long-tapered fine-grit carbide-point bit, 1/2" (13mm)-dia. rubber sanding drum mandrel
- Chip-carving knife
- Stab knife
- Erasers: soft non-latex rubber; ink
- Drill and 1/8" (3mm) bit
- Airbrush

### SPECIAL SOURCES:

Glass eyes are available from Van Dyke's Taxidermy Supply Company, 800-279-7358, [www.vandykestaxidermy.com](http://www.vandykestaxidermy.com).

*The author used these products for the project. Substitute your choice of brands, tools, and materials as desired.*

## Fin chip patterns



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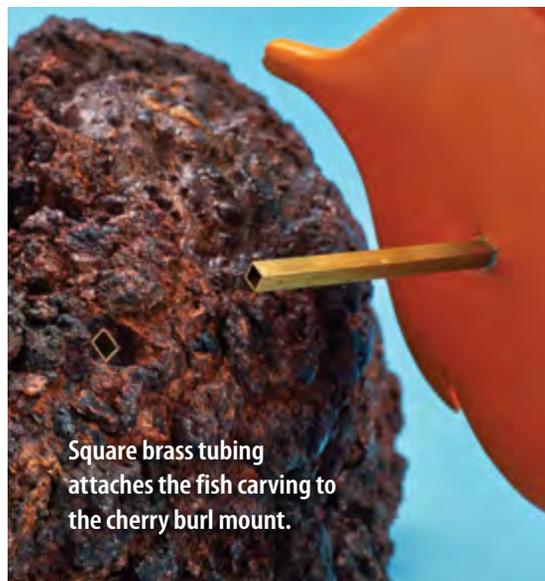
### Painting the Fish

Cover the glass eye with the plastic cup it came packaged in. Hand-paint the green and orange flower highlights, allow the paint to dry, and then cover it with a piece of paper towel as a mask. I apply a coat of pearlescent white to the whole surface with an airbrush. Then, spray a coat of primary yellow-orange at a low angle so the paint lays on the surface and doesn't get inside the cuts. This creates a two-tone effect that adds to the abstract impression of fish scales. Add more red to the mixture and concentrate the spray on the high points and outside edges. After the paint dries, apply two or three thin coats of clear acrylic finish.



### Mounting the Fish

I use telescoping square brass tubing to attach the yellow tang to a piece of cherry burl. I cover the burl with boiled linseed oil, allow it to cure, and apply two coats of spray lacquer. Attach two hangers to the flat side of the burl to hang the piece on the wall.



Square brass tubing attaches the fish carving to the cherry burl mount.



*Bill Johnson lives in the mountains an hour west of Asheville, N.C., with his wife. His two grown daughters*

*and six (about to be seven) grandchildren are also nearby. Bill's other hobbies include woodworking, scuba diving, and keeping saltwater fish and corals. For more of his work, visit [www.CarolinaMountainReefs.com](http://www.CarolinaMountainReefs.com).*