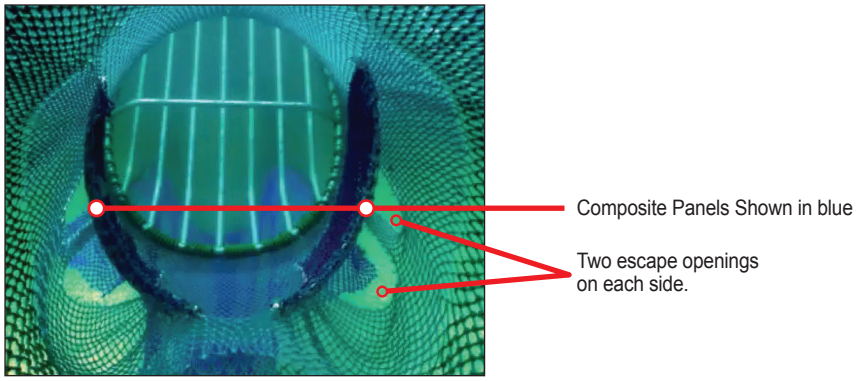
Composite Panel BRD with Fish Deflector Cone

DESCRIPTION

The Composite Panel Bycatch Reduction Device (BRD)(See "A" in Figures 1, 2 and 3) with a Fish Deflector Cone (Cone) (See "B" in Figures 2 and 3) is an effective BRD combination that has been shown to reduce total bycatch by at least 51.3 percent by weight with 91.8 percent shrimp retention. This certified BRD requires two components – the Composite Panel BRD extension (Figure 1) and the Fish Deflector Cone behind it. (Figures 2 and 3)

The Composite Panel BRD is a funnel type apparatus that is fitted in the net immediately behind the Turtle Excluder Device (TED). The "funnel" consists of two composite panels installed in the lower part of the BRD extension. Each composite panel is constructed by combining two overlapping pieces of netting, which are a diamond mesh interior piece and a square mesh exterior piece. The square mesh exterior piece provides support to the funnel structure. The properly installed funnel creates areas of slow water flow within the trawl, allowing bycatch to swim out through two triangular escape openings that are cut into the BRD extension on each side of the trawl (four total openings). See Figure 1 below of the Composite Panel BRD in use.

Figure 1. "A" Composite Panel BRD (pictured in use) installed behind the TED. Note the four escape openings, two on each side.



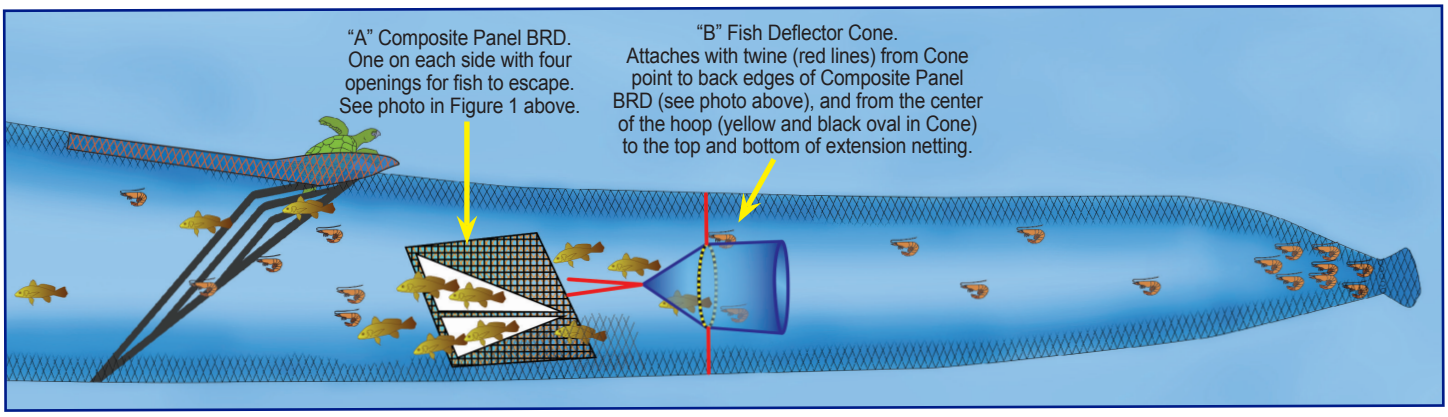


Figure 2. Side view from TED to codend with Composite Panel BRD and the Fish Deflector Cone. Top-shooting TED shown but bottom shooting TED is appropriate as well.

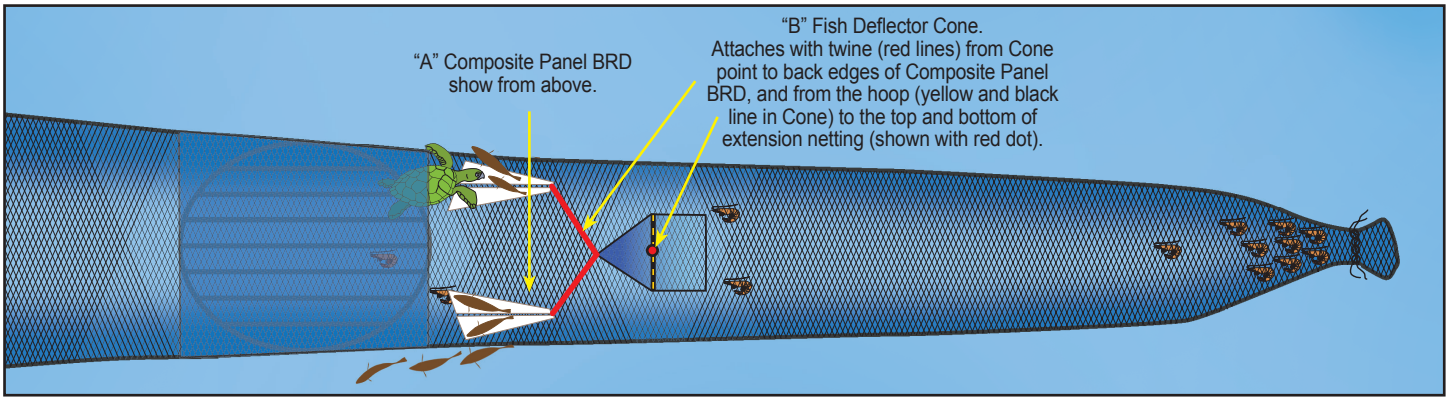


Figure 3. Top view from TED to codend with Composite Panel BRD and the Fish Deflector Cone.

The Cone is a semi-rigid piece that stimulates fish to swim through the escape openings. It is made of a cable hoop and two triangular pieces of netting that attach to the rear of the composite panels and is held by two anchor lines within the extension. When used together, these modifications to shrimp trawl net gear make up one of the certified BRD configurations that is required by law when fishing Gulf of Mexico federal waters.

CONSTRUCTION AND INSTALLATION INSTRUCTIONS

Step 1: Construction of the BRD Extension:

To build the BRD extension, a single piece of 1-1/2-inch to 1-3/4-inch (3.8cm to 4.5cm) netting 24.5 meshes by 149.5 meshes is needed. (See Figure 4 below.) Note: This will be joined at the short sides, forming a cylindrical BRD extension in the final steps.

Step 2: Construction of the Escape Openings:

First, orient the BRD extension netting so that the left corner of the leading edge starts on a whole mesh. Then, count 39.5 meshes along the leading edge of the netting. Start the first escape opening of the set by making a 9-mesh cut on an even row of meshes 1.5 meshes inward of the leading edge of the BRD extension netting. Next, turn 90 degrees and cut 15 points on an even row toward the trailing edge of the BRD extension netting. At this point, turn and cut 18 bars forward and to the left. Finish the escape opening by cutting 6 points toward the original starting point.

The second opening of the set is a mirror image of the first opening with 5 meshes of space between the openings. From the top right corner of the second opening, count 25 whole meshes to the right parallel to the leading edge of the BRD extension netting and repeat the previous steps to create the second set of escape openings. Double selvedge to re-enforce opening.

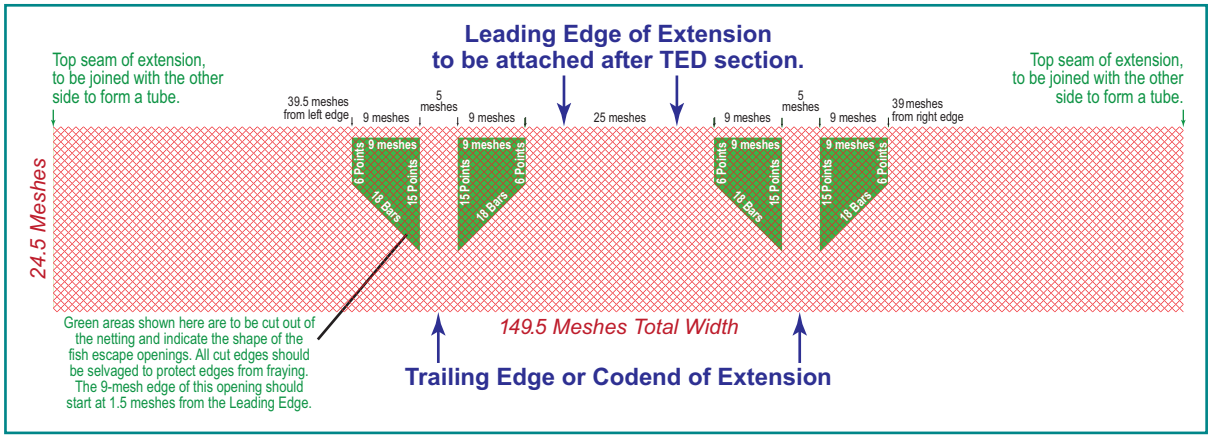


Figure 4. Details of the BRD extension.

Step 3: Construction of the Composite Panels:

(See Figure 5) The interior layer is constructed from a rectangular piece of 1-5/8-inch (41 mm) heat-set and depth-stretched polyethylene Diamond Mesh (DM) netting 36 meshes on the leading edge by 20 meshes deep. (See detailed illustration in Figure 5.) The second supportive structural layer is a piece of 2-inch (51 mm) square mesh (SM) netting (1 inch bar) 18 squares on the leading edge and 32 squares down each side. The requirements for the square mesh piece do not specify a particular netting material, but knotless is recommended to prevent slippage. If using knotless, burn the cut ends.

Attach the 18-square mesh side along the 36-mesh diamond with two diamond meshes per square. This will be the leading edge. Next, attach the 32-square mesh evenly along the first row of meshes on the 20-mesh diamond netting. Place the panel flat and check that the trailing edges align. If too long, cut the square mesh (usual suspect) on the trailing edge and burn the cut ends. Attach the trailing edge with the same procedure as the leading edge and attach other 32/20 sides so the panel is completely sewn. Construct a second panel using the same method

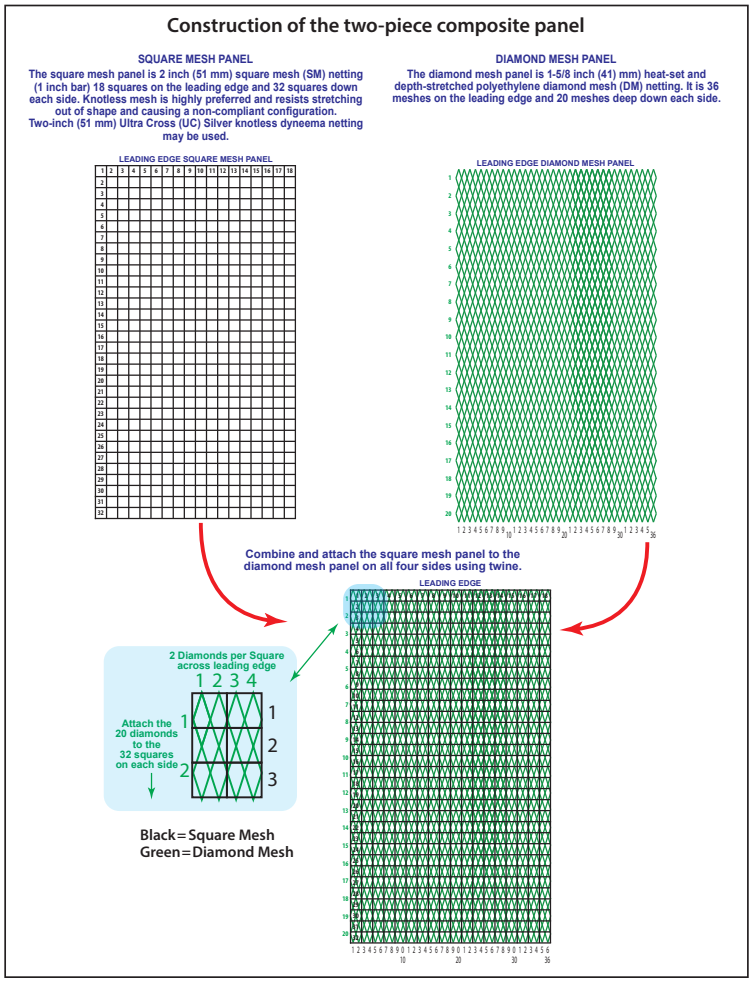


Figure 5. Details of the constuction of the Composite Panels.

Step 4: Attach Composite Panels into the BRD Extension

The two composite panels are attached inside the BRD extension. (See Figure 6.) One panel covers each set of BRD extension openings. The composite panel will be oriented so that the square mesh layer is facing the BRD extension netting and escape openings. For each set of escape openings, the 36-mesh leading edge of the composite panel diamond mesh is sewn evenly across the leading edge of the escape openings and netting brace (24 meshes). Alternately, sew 2 meshes of the panel DM to 1 mesh of the BRD extension netting, then 1 mesh of the panel DM to 1 mesh of the BRD extension netting.

From the inside corners of the escape openings, the 20-mesh sides of the panel DMs are attached to the BRD extension netting on a 2 bar, 1 point angle toward the back center of the BRD extension forming a V-shape in the center of the BRD extension netting. The interior trailing corners will have 5 meshes between them once both panels are installed. The opposite 20 mesh side of the panel DMs are then attached to the BRD extension on the bars angling back and away from the escape openings. Note: BRD Extension will be slightly bunched once the panels are fully attached.

Step 5: Sew Sides Together to make Cylinder

The 24.5-mesh sides of the BRD extension are joined to form a tube of extension netting. The seam will be located at the top of the BRD extension. If nylon is used in the construction of the BRD, a net treatment (dip) should be applied before use.

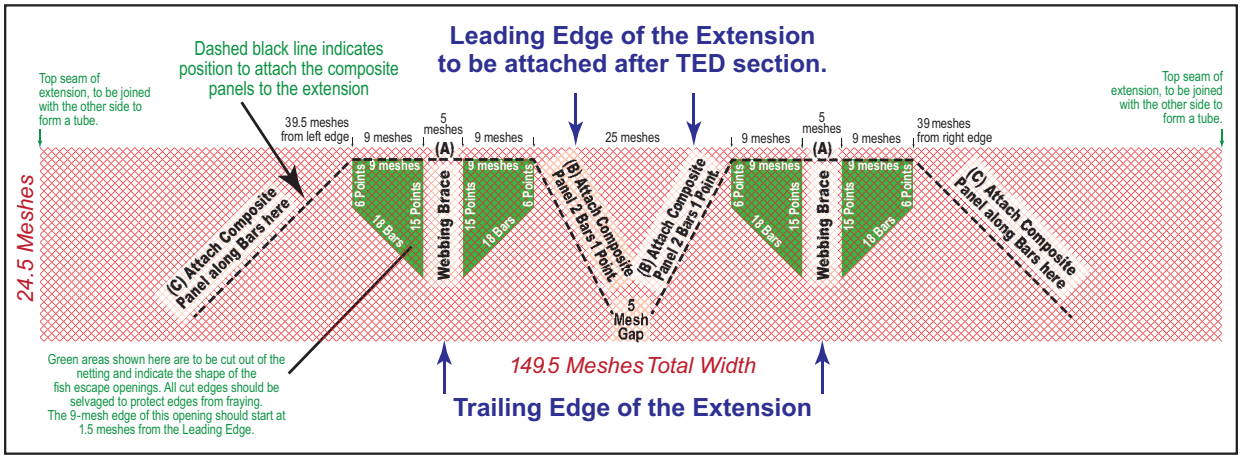


Figure 6. Attach the two composite panels inside BRD Extention as shown above. Then the 25.5 mesh side are joined to form a tube

Step 6: Cone Construction

The cone is constructed of two pieces of 1-5/8 -inch (41 mm) polypropylene or polyethylene netting, 40 meshes wide by 20 meshes in length. (See Figure 7 below for details.) Cut the 20 mesh sides evenly on the bar to form a triangle. Starting at the point, sew the two triangles together on the sides and leave the 40-mesh base open.

Construct a hoop using 5/16-inch (8 mm) or 3/8-inch (9.5 mm) cable that is 34.5 inches (88 mm) in length and join it at the ends with a 3-inch length of aluminum pipe (3/8-inch, 9.5 mm) pressed with a 1/4 inch (6.4 mm) die. The hoop is attached with heavy twine inside the netting cone at 10 meshes from the point.

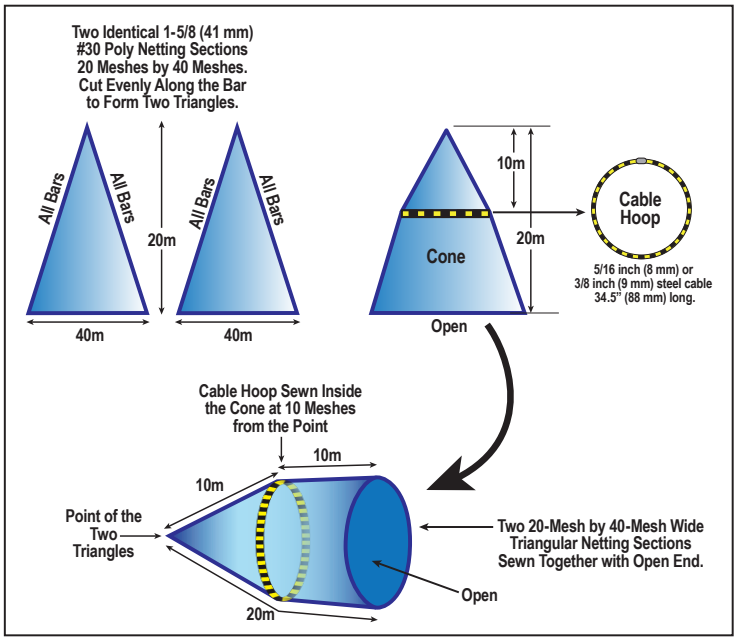


Figure 7. Details of Cone constuction.

Step 7: Cone Installation

The cone tip must be 12 inches (30.5 cm) or less behind the back edge of the composite panels, and the cone attached in four places. See illustrations below for a side view (Figure 8) and top view (Figure 9).

Cut a 3-foot piece of #60 twine (or a minimum 4 mesh wide strip of #21 or heavier netting). Attach the midpoint to the cone tip. Center and attach the ends 5 meshes or closer on the back edge of the panels. To secure the cone, attach two 12-inch (30.5 cm) pieces of #60 (or heavier) twine to the top and bottom of the cone hoop. The opposite ends of twine attach to the top and bottom center of the extension netting to keep the cone from moving forward.

The cone may extend beyond the BRD extension, but this is allowed.

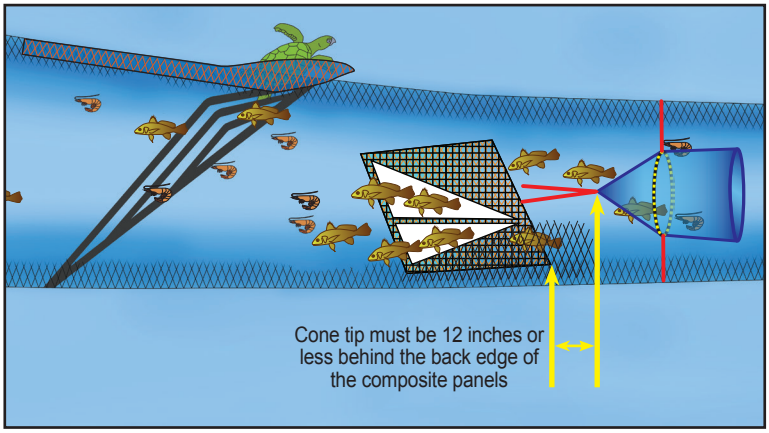


Figure 8. Side view of the Cone installation, 12 inches or less behind the Composite Panels.

Step 8: Connect to TED Extension

The Composite Panel BRD extension connects to the TED extension no more than 4 meshes from the back edge of the TED grid (bottom or top shooting). If the TED extension is longer than 4 meshes, the excess netting should be removed on an even row of meshes. The BRD extension top seam is located on top of the trawl when towing, so the composite panels always rest on the bottom of the net. Complete the installation by attaching the codend (bag) to the trailing edge of the BRD extension.

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For more information on the project, please visit
www.laseagrant.org/outreach/projects/better-brds/

This document was prepared for general informational purposes in October 2022 and has no legal force or effect. Please refer to the federal BRD regulations, 50 CFR part 622 and 622 Appendix D and the Federal Register for specific and controlling BRD requirements.