

PROCLAMATION**RE: SHRIMP TRAWL BRD REQUIREMENTS**

Dr. Louis B. Daniel III, Director, Division of Marine Fisheries, hereby announces that effective at 12:01 A.M. Monday, June 1, 2015 the following restrictions apply to shrimp trawls (otter and skimmer trawls):

I. GEAR RESTRICTIONS:

It is unlawful for a person to use a shrimp trawl in coastal fishing waters without an authorized North Carolina Division of Marine Fisheries (NCDMF) Bycatch Reduction Device(s) (BRD) properly installed and operational in the cod end of EACH net as outlined below. Authorized NCDMF BRDs include:

A. Florida Fish Excluder (FFE) (Figure 1 and Table 1):

1. Description: Cone-shaped rigid frame constructed from aluminum, steel, or stainless steel round bar or tubing which is inserted into the cod end to form an escape opening. Minimum construction and installation requirements stated below.
2. The FFE shall be installed on the outside of the trawl. The webbing of the trawl attached to the FFE cannot cover more than 50% of the FFE.
3. The escapement opening of the FFE shall be diamond in shape and shall remain unobstructed at all times. Diamond shaped FFE shall measure at least 5 1/2 inches x 6 1/2 inches or 6 inches x 6 inches, inside diameter (see Figure 1).
4. Placement of the apex (narrow end) of the FFE shall be toward the headrope of the trawl (forward).
5. A FFE shall have at least three (3) legs and no more than four (4) legs and measure at least 12 inches in length (see Figure 1).
6. The opening of the FFE shall be installed on the outside of the cod end of the trawl no further forward than 65% of the functional cod end length measured from the cod end tie-off rings (Table 1).
7. The center of the FFE escapement opening shall be installed no more than 19 meshes from the top centerline of the cod end.
8. A FFE shall be constructed from aluminum, steel, or stainless steel round bar or tubing.

B. Fisheye (Figures 2 and 3):

1. Description: The Fisheye BRD is a cone-shaped rigid frame constructed from aluminum or steel rod of at least $\frac{1}{4}$ inch (6.35 mm) diameter, which is inserted into the cod end to form an escape opening. Minimum construction and installation requirements stated below.
2. The Fisheye has a minimum escape opening dimension of 5 inches (12.7 cm) and a minimum total escape opening area of 36 in^2 (91.4 cm^2) [inside dimensions, not bar lengths (Figure 2 and 3)].
3. The Fisheye shall be installed on the outside of the trawl. The webbing of the trawl attached to the Fisheye cannot cover more than 50% of the Fisheye.
4. When the Fisheye BRD is installed, no part of the lazy line attachment system (i.e., any mechanism, such as elephant ears or choker straps, used to attach the lazy line to the cod end) may overlap the Fisheye escape opening when the Fisheye is installed aft of the attachment point of the cod end retrieval system. The escapement opening of the Fisheye BRD shall remain unobstructed at all times.
5. The Fisheye BRD must be installed at the top center of the cod end of the trawl to create an escape opening in the trawl facing the direction of the mouth of the trawl no further forward than 11 ft (3.4 m) from the cod end tie-off rings.
6. Placement of the apex (narrow end) of the Fisheye shall be toward the headrope of the trawl (forward).

C. Gulf Fisheye (Figures 2, 3, and 4):

1. Description: The Gulf Fisheye is a cone-shaped rigid frame constructed from aluminum or steel rod of at least $\frac{1}{4}$ inch (6.35 mm) diameter, which is inserted into the top center of the cod end, and is offset not more than 15 meshes perpendicular to the top center of the cod end to form an escape opening. Minimum construction and installation requirements stated below.
2. The Gulf Fisheye has a minimum escape opening dimension of 5 inches (12.7 cm) and a minimum total escape opening area of 36 in^2 (91.4 cm^2) [inside dimensions, not bar lengths] (Figure 2 and 3).
3. The Gulf Fisheye shall be installed on the outside of the trawl. The webbing of the trawl attached to the Gulf Fisheye cannot cover more than 50% of the Fisheye.
4. The Gulf Fisheye BRD must be installed in the cod end of the trawl to create an escape opening in the trawl, facing in the direction of the mouth of the trawl, no less than 8.5 ft (2.59 m) and no further forward than 12.5 ft (3.81 m) from the cod end tie-off rings, and may be offset no more than 15 meshes perpendicular to the top center of the cod end (Figure 4).
5. When the Gulf Fisheye BRD is installed, no part of the lazy line attachment system (i.e., any mechanism, such as elephant ears or choker straps, used to attach the lazy line to the cod end) may overlap the Fisheye escape opening when the Fisheye is installed aft of the attachment point of the cod end retrieval system. The escapement opening of the Gulf Fisheye shall remain unobstructed at all times.
6. Placement of the apex (narrow end) of the Gulf Fisheye shall be toward the headrope of the trawl (forward).

D. Eight (8) inch PVC "Sea Eagle" Fish Excluder (Figure 5 and Table 2):

1. Description: The "Sea Eagle" Fish Excluder is a cone-shaped device similar to the Florida Fish Excluder and is constructed out of PVC pipe and has a trap door that is designed to close on haul back to prevent escapement of shrimp. The device is inserted into the cod end to form an escapement opening. Minimum construction and installation requirements stated below.
2. Placement of the apex (narrow end) of the "Sea Eagle" shall face the cod end of the trawl (aft).
3. The opening of the "Sea Eagle" shall be eight (8) inches in diameter and installed in the cod end of the trawl no further forward than 38% of the functional cod end length from the cod end tie-off rings (Table 2).
4. The center of the "Sea Eagle" escapement opening shall be installed on either side of the cod end between 0 and 15 meshes from the top centerline of the cod end.
5. The escapement opening of the "Sea Eagle" shall be unobstructed (the escapement flap shall be free to move and a fish retention grate shall not be present).

E. General Eight (8) Inch and Ten (10) Inch Large Mesh and Extended Mesh Funnel BRD (Figures 6, 7, 8, 9, and 10):

1. Description: Devices consist of a funnel of small mesh netting within a cylinder of large mesh netting, held open by one semi-rigid hoop, and are installed in the trawl net behind a National Marine Fisheries Service (NMFS) certified Turtle Excluder Device (TED). One side of the funnel is extended vertically to provide passage for shrimp to the cod end and to create an area of reduced water flow to allow for fish escapement through the larger mesh outer netting. Minimum construction and installation requirements stated below.
2. The small mesh funnel and large mesh section shall be positioned within extension sections constructed of 1 5/8 inch stretched mesh # 30 nylon twine. The extension section shall be 120 meshes in circumference. The extension section in front of the large mesh section shall be 6 1/2 meshes long, and the extension section behind the large mesh section shall be 23 meshes long.
3. The small mesh funnel shall be constructed from four (4) pieces of 1 1/2 inch stretched mesh, size # 24 twine or larger, depth stretched and heat set polyethylene webbing.
4. The small mesh funnel shall have a circumference of 120 meshes at the leading edge and 78 meshes at the trailing edge. The short side of the funnel shall be 23 meshes long, while the long side of the funnel shall be 38 1/2 meshes long. The leading edge of the funnel shall be attached three (3) meshes forward of the leading edge of the large mesh section. The eight (8) meshes at the back edge of the top and bottom sections are attached three (3) meshes behind the soft cable hoop, and are centered at the top and bottom of the extension webbing, mesh for mesh. The long side section of the funnel shall be attached to the extension webbing on the top and bottom beginning at the back edge of the top and bottom section. The sewing sequence for this section shall be two (2) meshes down, one (1) mesh over toward the top and bottom centerlines.
5. The large mesh outer section shall be 10 inch stretched mesh netting, 10 mm polyester, or # 120 nylon or heavier, hung on the square, with a **circumference of 19 meshes (95 inches)** and a length of three (3) meshes (15"), or the large mesh outer section shall be 8 inch stretched mesh netting, 4 mm polyester, or # 120 nylon or heavier, hung on the square, **with a circumference of**

23 meshes (95 inches) and a length of four (4) meshes (15 inches").

6. The leading edge of the large mesh section shall be attached to the trailing edge of the front extension. The trailing edge of the large mesh outer section is attached to the leading edge of the back extension.
7. A single hoop, constructed from 1/2 inch (0.5 inch") plastic coated cable measuring **94 1/4 inch** in length (30 inch diameter), shall be attached five (5) meshes back from the leading edge of the back extension.
8. The large mesh escapement opening must be unobstructed.
9. This BRD is installed between the TED and the cod end. When installed behind a hard TED, the leading edge of the 6 1/2 mesh front extension is attached five (5) meshes behind the posterior edge (trailing edge) of the TED. Any part of the TED extension greater than five (5) meshes long must be removed. When installed behind a soft TED, the device is placed between the TED extension and the cod end.

F. Eight (8) Inch and Ten (10) Inch Inshore Large Mesh and Extended Funnel BRD (Figures 6, 7, 8, 9, and 10):

1. Description. Devices consist of a funnel of small mesh netting within a cylinder of large mesh netting, held open by one semi-rigid hoop, and are installed in the trawl net behind a National Marine Fisheries Service (NMFS) certified Turtle Excluder Device (TED). One side of the funnel is extended vertically to provide passage for shrimp to the cod end and to create an area of reduced water flow to allow for fish escapement through the larger mesh outer netting. Minimum construction and installation requirements stated below.
2. The small mesh funnel and large mesh section shall be positioned within extension sections constructed of 1 3/8 inch stretched mesh #18 nylon twine. The extension section shall be 120 meshes in circumference. The extension section in front of the large mesh section shall be 6 1/2 meshes long and the extension section behind the large mesh section shall be 23 meshes long.
3. The small mesh funnel shall be constructed from four (4) pieces of 1 3/8 inches stretched mesh, size # 18 twine or larger, depth stretched and heat set polyethylene webbing.
4. The small mesh funnel shall have a circumference of 120 meshes at the leading edge and 78 meshes at the trailing edge. The short side of the funnel shall be 23 meshes long, while the long side of the funnel shall be 38 1/2 meshes long. The leading edge of the funnel shall be attached three (3) meshes forward of the leading edge of the large mesh section. The eight (8) meshes at the back edge of the top and bottom sections are attached three (3) meshes behind the soft cable hoop and are centered at the top and bottom of the extension webbing, mesh for mesh. The long side section of beginning at the back edge of the top and bottom section. The funnel shall be attached to the extension's webbing on the top and bottom. The sewing sequence for this section shall be two (2) meshes down, one (1) mesh over toward the top and bottom centerlines.
5. The large mesh outer section shall be 10 inch stretched mesh netting, 10 mm polyester, or #120 nylon or heavier, hung on the square with a circumference of **14 1/2 meshes (75 inches)** and a length of three (3) meshes (15 inch), or the large mesh outer section shall be 8 inch stretched mesh netting, 4 mm polyester, or # 120 nylon or heavier, hung on the square, **with a circumference of 19 meshes (75 inch)** and a length of four (4) meshes (15 inch).

6. The leading edge of the large mesh section shall be attached to the trailing edge of the front extension. The trailing edge of the large mesh outer section is attached to the leading edge of the back extension.
7. A single hoop, constructed from 3/8 inch (0.38 inch) plastic coated cable measuring **75 1/2 inch** in length shall be attached five (5) meshes back from the leading edge of the back extension.
8. The large mesh escapement opening must be unobstructed.
9. This BRD is installed between the TED and the cod end. When installed behind a hard TED, the leading edge of the 6 1/2 mesh front extension is attached five (5) meshes behind the posterior edge (trailing edge) of the TED. Any part of the TED extension greater than five (5) meshes long must be removed. When installed behind a soft TED, the device is placed between the TED extension and the cod end.

G. Large Mesh Funnel Excluder (LMFE) (Figures 6,7,8, 9, and 10):

1. Description. This device consists of a funnel of small mesh netting within a cylinder of larger mesh netting, held open by two (2) semi-rigid hoops, and is installed in the cod end of the trawl. This device must be installed behind a NMFS certified TED if a TED is required. This BRD shall meet the following specifications:
2. The small mesh funnel shall be made from two (2) sections of 1 1/2 inch or 1 5/8 inch, # 24 twine or larger, depth stretched and heat set polyethylene webbing. Funnels having a leading edge of 100 meshes circumference must have a trailing edge of at least 40 meshes and not more than 60 meshes circumference. The funnel must be 30 meshes long. Funnels having a leading edge of 120 meshes circumference must have a trailing edge of at least 60 meshes and not more than 80 meshes in circumference. The funnel must be 30 meshes long.
3. The mesh escapement section shall be no smaller than 19 inch long and shall be 94 1/2 inch in circumference.
4. The large mesh escapement webbing shall be made from no smaller than 4 inch stretched mesh webbing hung on a square.
5. The mesh escapement opening shall remain unobstructed at all times.
6. The leading edge of the small mesh funnel and the leading edge of the large mesh escapement webbing shall be attached to a hoop, 94 1/2 inch in length (30 inch diameter), made from at least 3/8 inch diameter combination-cable or plastic coated towing cable. The trailing edge of the large mesh escapement webbing shall be attached to the second hoop constructed identical to the forward hoop.
7. The top and bottom ends of the trailing edge of the small funnel shall be attached to the top and bottom of the cod end, respectively, so the funnel remains taut while being towed.

H. Jones-Davis:

1. Description. The Jones-Davis BRD is similar to the expanded mesh and the extended funnel BRDs except that the fish escape openings are windows cut around the funnel rather than large-mesh sections. In addition, a webbing cone fish deflector is installed behind the funnel. Minimum construction and installation requirements stated below.

2. Webbing extension. The webbing extension must be constructed from a single piece of 1 5/8 inch (3.5 cm) stretch mesh # 30 nylon 42 meshes by 120 meshes. A tube is formed from the extension webbing by sewing the 42-mesh side together.
3. 28 inch (71.1cm) cable hoop. A single hoop must be constructed of 1/2 inch (1.3 cm) steel cable 88 inch (223.5 cm) in length. The cable must be joined at its ends by a 3 inch (7.6 cm) piece of 1/2 inch (1.3 cm) aluminum pipe and pressed with a 3/8 inch (0.95 cm) die to form a hoop. The inside diameter of this hoop must be between 27 and 29 inches (68.6 and 73.7 cm). The hoop must be attached to the extension webbing 17 1/2 meshes behind the leading edge. The extension webbing must be quartered and attached in four places around the hoop, and every other mesh must be attached all the way around the hoop using # 24 twine or larger. The hoop must be laced with 3/8 inch (0.95 cm) polypropylene or polyethylene rope for chaffing.
4. 24 inch (61.0 cm) hoop. A single hoop must be constructed of either # 60 twine 80 inches (203.2 cm) in length or 3/8 inch (0.95 cm) steel cable 75 1/2 inches (191.8 cm) in length. If twine is used, the twine must be laced in and out of the extension webbing 39 meshes behind the leading edge, and the ends must be tied together. If cable is used, the cable must be joined at its ends by a 3 inch (7.6 cm) piece of 3/8 inch (0.95 cm) aluminum pipe and pressed together with a 1/4 inch (0.64 cm) die to form a hoop. The inside diameter of this hoop must be between 23 and 25 inches (58.4 and 63.4 cm). The hoop must be attached to the extension webbing 39 meshes behind the leading edge. The extension webbing must be quartered and attached in four places around the hoop, and every other mesh must be attached all the way around the hoop using # 24 twine or larger. The hoop must be laced with 3/8 inch (0.95 cm) polypropylene or polyethylene rope for chaffing.
5. Funnel. The funnel must be constructed from four sections of 1 1/2 inch (3.8 cm) heat-set and depth-stretched polypropylene or polyethylene webbing. The two side sections must be rectangular in shape, 29 1/2 meshes on the leading edge by 23 meshes deep. The top and bottom sections are 29 1/2 meshes on the leading edge by 23 meshes deep and tapered 1 point 2 bars on both sides down to 8 meshes across the back. The four sections must be sewn together down the 23 mesh edge to form the funnel.
6. Attachment of the funnel in the webbing extension. The funnel must be installed two meshes behind the leading edge of the extension starting at the center seam of the extension and the center mesh of the funnel's top section leading edge. On the same row of meshes, the funnel must be sewn evenly all the way around the inside of the extension. The funnel's top and bottom back edges must be attached one mesh behind the 28 inch (71.1 cm) cable hoop (front hoop). Starting at the top center seam, the back edge of the top funnel section must be attached 4 meshes each side of the center. Counting around 60 meshes from the top center, the back edge of the bottom section must be attached 4 meshes on each side of the bottom center. Clearance between the side of the funnel and the 28 inch (71.1 cm) cable hoop (front hoop) must be at least 6 inches (15.2 cm) when measured in the hanging position.
7. Cutting the escape openings. The leading edge of the escape opening must be located within 18 inches (45.7 cm) of the posterior edge of the turtle excluder device (TED) grid. The area of the escape opening must total at least 864 in² (5,574.2 cm²). Two escape openings 10 meshes wide by 13 meshes deep must be cut 6 meshes apart in the extension webbing, starting at the top center extension seam, 3 meshes back from the leading edge and 16 meshes to the left and to the right (total of four openings). The four escape openings must be double-selvaged for strength. The escape openings shall remain unobstructed at all times.

8. Alternative Method for Constructing the Funnel and Escape Openings. The following method for constructing the funnel and escape openings may be used instead of the method described in paragraphs F.2.d., F.2.e., and F.2.f. of this section. With this alternative method, the funnel and escape openings are formed by cutting a flap in each side of the extension webbing; pushing the flaps inward; and attaching the top and bottom edges along the bars of the extension webbing to form the V-shape of the funnel. Minimum requirements applicable to this method include: (1) The funnel's top and bottom back edges must be attached one mesh behind the 28 inch (71.1 cm) cable hoop (front hoop); (2) clearance between the side of the funnel and the 28 inch (71.1 cm) cable hoop (front hoop) must be at least 6 inches (15.2 cm) when measured in the hanging position; (3) the leading edge of the escape opening must be located within 18 inches (45.7 cm) of the posterior edge of the turtle excluder device (TED) grid; and, (4) the area of the escape opening must total at least 864 in² (5,574.2 cm²). To construct the funnel and escape openings using this method, begin 3 1/2 meshes from the leading edge of the extension, at the top center seam, count over 18 meshes on each side, and cut 13 meshes toward the back of the extension. Turn parallel to the leading edge, and cut 26 meshes toward the bottom center of the extension. Next, turn parallel to the top center seam, and cut 13 meshes forward toward the leading edge, creating a flap of webbing 13 meshes by 26 meshes by 13 meshes. Lengthen the flap to 18 meshes by adding a 4 1/2 mesh by 26 mesh rectangular section of webbing to the 26 mesh edge. Attach the 18 mesh edges to the top and bottom of the extension by sewing 2 bars of the extension to 1 mesh on the flap in toward the top center and bottom center of the extension, forming the exit opening and the funnel. Connect the two flaps together in the center with a 7 inch piece of # 42 twine to allow adequate clearance for fish escapement between the flaps and the side openings. On each side, sew a 6-mesh by 10 1/2 mesh section of webbing to 6 meshes of the center of the 26 mesh cut on the extension and 6 meshes centered between the 13 mesh cuts 3 1/2 meshes from the leading edge. This forms two 10 mesh by 13 mesh openings on each side.
9. Cone fish deflector: The cone fish deflector is constructed of two pieces of 1 5/8 inch (4.13 cm) polypropylene or polyethylene webbing, 40 meshes wide by 20 meshes in length and cut on the bar on each side forming a triangle. Starting at the apex of the two triangles, the two pieces must be sewn together to form a cone of webbing. The apex of the cone fish deflector must be positioned within 10-14 inches (25.4-35.6 cm) of the posterior edge of the funnel.
10. 11 inch (27.9 cm) cable hoop for cone deflector. A single hoop must be constructed of 5/16 inch (0.79 cm) or 3/8 inch (0.95 cm) cable 34 1/2 inches (87.6 cm) in length. The ends must be joined by a 3 inch (7.6 cm) piece of 3/8 inch (0.95 cm) aluminum pipe pressed together with a 1/4 inch (0.64 cm) die. The hoop must be inserted in the webbing cone, attached 10 meshes from the apex and laced all the way around with heavy twine.
11. Installation of the cone in the extension: The cone must be installed in the extension 12 inches (30.5 cm) behind the back edge of the funnel and attached in four places. The midpoint of a piece of # 60 twine 4 ft (1.22 m) in length must be attached to the apex of the cone. This piece of twine must be attached to the 28 inch (71.1 cm) cable hoop at the center of each of its sides; the points of attachment for the two pieces of twine must be measured 20 inches (50.8 cm) from the midpoint attachment. Two 8 inch (20.3 cm) pieces of # 60 twine must be attached to the top and bottom of the 11 inch (27.9 cm) cone hoop. The opposite ends of these two pieces of twine must be attached to the top and bottom center of the 24 inch (61 cm) cable hoop; the points of attachment for the two pieces of twine must be measured 4 inches (10.2 cm) from the points where they are tied to the 11 inch (27.9 cm) cone hoop.

I. Modified Jones-Davis:

1. Description: The Modified Jones-Davis BRD is a variation to the alternative funnel construction method of the Jones-Davis BRD except the funnel is assembled by using depth-stretched and heat-set polyethylene webbing instead of the flaps formed from the extension webbing. In addition, no hoops are used to hold the BRD open. Minimum construction and installation requirements stated below.
2. Webbing extension: The webbing extension must be constructed from a single rectangular piece of 1 5/8 inch (4.1 cm) stretch mesh # 30 nylon with dimensions of 39 1/2 meshes by 150 meshes. A tube is formed from the extension webbing by sewing the 39 1/2 mesh sides together.
3. Funnel: The funnel must be constructed from two sections of 1 5/8 inch (4.1 cm) heat-set and depth-stretched polypropylene or polyethylene webbing. The two side sections must be rectangular in shape, 25 meshes on the leading edge by 21 meshes deep. The 25 mesh leading edge of each polyethylene webbing section must be sewn evenly two meshes in from the front of the extension webbing starting 25 meshes from the top center on each side. The 21 mesh edge must be sewn to the extension webbing on a 9 bar and 1 mesh angle in the top and bottom, forming a V-shape funnel.
4. Cutting the escape opening. The leading edge of the escape openings must be located within 18 inches (45.7 cm) of the posterior edge of the turtle excluder device (TED) grid. The area of the escape opening must total at least 635 in² (4,097 cm²). Two escape openings, 6 meshes wide by 12 meshes deep, must be cut 4 meshes apart in the extension webbing, starting at the top center extension seam, 7 meshes back from the leading edge, and 30 meshes to the left and to the right (total of four openings). The four escape openings must be double-selvaged for strength. The four escape openings shall remain unobstructed at all times.
5. Cone fish deflector. The cone fish deflector is constructed of 2 pieces of 1 5/8 inch (4.1 cm) polypropylene or polyethylene webbing, 40 meshes wide by 20 meshes in length and cut on the bar on each side forming a triangle. Starting at the apex of the two triangles, the two pieces must be sewn together to form a cone of webbing. The apex of the cone fish deflector must be positioned within 12 inches (30.5 cm) of the posterior edge of the funnel.
6. 11 inch (27.9 cm) cable hoop for cone deflector. A single hoop must be constructed of 5/16 inch (0.79 cm) or 3/8 inch (0.95 cm) cable 34 1/2 inches (87.6 cm) in length. The ends must be joined by a 3 inch (7.6 cm) piece of 3/8 inch (0.95 cm) aluminum pipe pressed together with a 1/4 inch (0.64 cm) die. The hoop must be inserted in the webbing cone, attached 10 meshes from the apex and laced all the way around with heavy twine.
7. Installation of the cone in the extension. The apex of the cone must be installed in the extension within 12 inches (30.5 cm) behind the back edge of the funnel and attached in four places. The midpoint of a piece of # 60 twine (or at least 4-mesh wide strip of # 21 or heavier webbing) 3 ft (1.22 m) in length must be attached to the apex of the cone. This piece of twine or webbing must be attached within 5 meshes of the aft edge of the funnel at the center of each of its sides. Two 12 inch (30.5 cm) pieces of # 60 (or heavier) twine must be attached to the top and bottom of the 11 inch (27.9 cm) cone hoop. The opposite ends of these two pieces of twine must be attached to the top and bottom center of the extension webbing to keep the cone from inverting into the funnel.

J. Cone Fish Deflector Composite Panel:

1. Description. The Cone Fish Deflector Composite Panel BRD is a variation to the alternative funnel construction method of the Jones-Davis BRD, except the funnel is assembled by using depth-stretched and heat-set polyethylene webbing with square mesh panels on the inside instead of the

flaps formed from the extension webbing. In addition, no hoops are used to hold the BRD open. Minimum construction and installation requirements stated below.

2. Webbing extension. The webbing extension must be constructed from a single rectangular piece of 1 1/2 inch to 1 3/4 inch (3.8 cm to 4.5 cm) stretch mesh with dimensions of 24 1/2 meshes by 150 to 160 meshes. A tube is formed from the extension webbing piece by sewing the 24 1/2 mesh sides together. The leading edge of the webbing extension must be attached no more than 4 meshes from the posterior edge of the TED grid.
3. Funnel. The V-shaped funnel consists of two webbing panels attached to the extension along the leading edge of the panels. The top and bottom edges of the panels are sewn diagonally across the extension toward the center to form the funnel. The panels are 2-ply in design, each with an inner layer of 1 1/2 inch to 1 5/8 inch (3.8 cm to 4.1 cm) heat-set and depth-stretched polyethylene webbing and an outer layer constructed of no larger than 2 inch (5.1 cm) square mesh webbing (1 inch bar). The inner webbing layer must be rectangular in shape, 36 meshes on the leading edge by 20 meshes deep. The 36 mesh leading edges of the polyethylene webbing should be sewn evenly to 24 meshes of the extension webbing 1 1/2 meshes from and parallel to the leading edge of the extension starting 12 meshes up from the bottom center on each side. Alternately sew 2 meshes of the polyethylene webbing to 1 mesh of the extension webbing then 1 mesh of the polyethylene webbing to 1 mesh of the extension webbing toward the top. The bottom 20 mesh edges of the polyethylene layers are sewn evenly to the extension webbing on a 2 bar 1 mesh angle toward the bottom back center forming a V-shape in the bottom of the extension webbing. The top 20 mesh edges of the polyethylene layers are sewn evenly along the bars of the extension webbing toward the top back center. The square mesh layers must be rectangular in shape and constructed of no larger than 2 inch (5.1 cm) webbing that is 18 inches (45.7 cm) in length on the leading edge. The depth of the square mesh layer must be no more than 2 inches (5.1 cm) less than the 20 mesh side of the inner polyethylene layer when stretched taught. The 18 inch (45.7 cm) leading edge of each square mesh layer must be sewn evenly to the 36 mesh leading edge of the polyethylene section and the sides are sewn evenly (in length) to the 20 mesh edges of the polyethylene webbing. This will form a V-shape funnel using the top of the extension webbing as the top of the funnel and the bottom of the extension webbing as the bottom of the funnel.
4. Cutting the escape opening. There are two escape openings on each side of the funnel. The leading edge of the escape openings must be located on the same row of meshes in the extension webbing as the leading edge of the composite panels. The lower openings are formed by starting at the first attachment point of the composite panels and cutting 9 meshes in the extension webbing on an even row of meshes toward the top of the extension. Next, turn 90 degrees and cut 15 points on an even row toward the back of the extension webbing. At this point turn and cut 18 bars toward the bottom front of the extension webbing. Finish the escape opening by cutting 6 points toward the original starting point. The top escape openings start 5 meshes above and mirror the lower openings. Starting at the leading edge of the composite panel and 5 meshes above the lower escape opening, cut 9 meshes in the extension on an even row of meshes toward the top of the extension. Next, turn 90 degrees, and cut 6 points on an even row toward the back of the extension webbing. Then cut 18 bars toward the bottom back of the extension. To complete the escape opening, cut 15 points forward toward the original starting point. The area of each escape opening must total at least 212 in² (1,368 cm²). The four escape openings must be double-selvaged for strength. The four escape openings shall be unobstructed at all times.
5. Cone fish deflector. The cone fish deflector is constructed of 2 pieces of 1 5/8 inch (4.1 cm) polypropylene or polyethylene webbing, 40 meshes wide by 20 meshes in length and cut on the bar on each side forming a triangle. Starting at the apex of the two triangles, the two pieces must be

sewn together to form a cone of webbing. The apex of the cone fish deflector must be positioned within 12 inches (30.5 cm) of the posterior edge of the funnel.

6. 11 inch (27.9 cm) cable hoop for cone deflector. A single hoop must be constructed of 5/16 inch (0.79 cm) or 3/8 inch (0.95 cm) cable 34 1/2 inches (87.6 cm) in length. The ends must be joined by a 3 inch (7.6 cm) piece of 3/8 inch (0.95 cm) aluminum pipe pressed together with a 1/4 inch (0.64 cm) die. The hoop must be inserted in the webbing cone, attached 10 meshes from the apex and laced all the way around with heavy twine.
7. Installation of the cone in the extension. The apex of the cone must be installed in the extension within 12 inches (30.5 cm) behind the back edge of the funnel and attached in four places. The midpoint of a piece of # 60 twine (or at least 4-mesh wide strip of # 21 or heavier webbing) 3 ft (1.22 m) in length must be attached to the apex of the cone. This piece of twine or webbing must be attached within 5 meshes of the aft edge of the funnel at the center of each of its sides. Two 12 inch (30.5 cm) pieces of # 60 (or heavier) twine must be attached to the top and bottom of the 11 inch (27.9 cm) cone hoop. The opposite ends of these two pieces of twine must be attached to the top and bottom center of the extension webbing to keep the cone from inverting into the funnel.

J. Square Mesh Panel (SMP) Composite Panel:

1. Description. The SMP is a panel of square mesh webbing placed in the top of the cod end to provide finfish escape openings. Minimum construction and installation requirements stated below.
2. Webbing extension. The webbing extension must be constructed from a single rectangular piece of 1 1/2 inch to 1 3/4 inch (3.8 cm to 4.5 cm) stretch mesh with dimensions of 24 1/2 meshes by 150 to 160 meshes. A tube is formed from the extension webbing piece by sewing the 24 1/2 mesh sides together. The leading edge of the webbing extension must be attached no more than 4 meshes from the posterior edge of the TED grid.
3. Funnel. The V-shaped funnel consists of two webbing panels attached to the extension along the leading edge of the panels. The top and bottom edges of the panels are sewn diagonally across the extension toward the center to form the funnel. The panels are 2-ply in design, each with an inner layer of 1 1/2 inch to 1 5/8 inch (3.8 cm to 4.1 cm) heat-set and depth-stretched polyethylene webbing and an outer layer constructed of no larger than 2 inch (5.1 cm) square mesh webbing (1 inch bar). The inner webbing layer must be rectangular in shape, 36 meshes on the leading edge by 20 meshes deep. The 36 mesh leading edges of the polyethylene webbing should be sewn evenly to 24 meshes of the extension webbing 1 1/2 meshes from and parallel to the leading edge of the extension starting 12 meshes up from the bottom center on each side. Alternately sew 2 meshes of the polyethylene webbing to 1 mesh of the extension webbing then 1 mesh of the polyethylene webbing to 1 mesh of the extension webbing toward the top. The bottom 20 mesh edges of the polyethylene layers are sewn evenly to the extension webbing on a 2 bar 1 mesh angle toward the bottom back center forming a V-shape in the bottom of the extension webbing. The top 20 mesh edges of the polyethylene layers are sewn evenly along the bars of the extension webbing toward the top back center. The square mesh layers must be rectangular in shape and constructed of no larger than 2 inch (5.1 cm) webbing that is 18 inches (45.7 cm) in length on the leading edge. The depth of the square mesh layer must be no more than 2 inches (5.1 cm) less than the 20 mesh side of the inner polyethylene layer when stretched taught. The 18 inch (45.7 cm) leading edge of each square mesh layer must be sewn evenly to the 36 mesh leading edge of the polyethylene section and the sides are sewn evenly (in length) to the 20 mesh edges of the polyethylene webbing. This will form a V-shape funnel using the top of the extension webbing as the top of the funnel and the bottom of the extension webbing as the bottom of the funnel.

4. Cutting the escape opening. There are two escape openings on each side of the funnel. The leading edge of the escape openings must be located on the same row of meshes in the extension webbing as the leading edge of the composite panels. The lower openings are formed by starting at the first attachment point of the composite panels and cutting 9 meshes in the extension webbing on an even row of meshes toward the top of the extension. Next, turn 90 degrees and cut 15 points on an even row toward the back of the extension webbing. At this point turn and cut 18 bars toward the bottom front of the extension webbing. Finish the escape opening by cutting 6 points toward the original starting point. The top escape openings start 5 meshes above and mirror the lower openings. Starting at the leading edge of the composite panel and 5 meshes above the lower escape opening, cut 9 meshes in the extension on an even row of meshes toward the top of the extension. Next, turn 90 degrees, and cut 6 points on an even row toward the back of the extension webbing. Then cut 18 bars toward the bottom back of the extension. To complete the escape opening, cut 15 points forward toward the original starting point. The area of each escape opening must total at least 212 in² (1,368 cm²). The four escape openings must be double-selvaged for strength. The four escape openings shall remain unobstructed at all times.
5. SMP. The SMP is constructed from a single piece of square mesh webbing with a minimum dimension of 5 squares wide and 12 squares in length with a minimum mesh size of 3 inch (76 mm) stretched mesh. The maximum twine diameter of the square mesh is # 96 twine (4 mm).
6. Cutting the SMP escape opening. The escape opening is a rectangular hole cut in the top center of the cod end webbing. The posterior edge of the escape opening must be placed no farther forward than 8 ft (2.4 m) from the cod end drawstring (tie-off rings). The width of the escape opening, as measured across the cod end, must be four cod end meshes per square of the SMP (i.e., a cut of 20 cod end meshes for a SMP that is 5 meshes wide). The stretched mesh length of the escape opening must be equal to the total length of the SMP. No portion of the SMP escape opening may be covered with additional material or netting such as chaffing webbing, which might impede or prevent fish escapement.
7. Installation of the SMP. The SMP must be attached to the edge of the escape opening evenly around the perimeter of the escape opening cut with heavy twine.

II. **SECOND BRD REQUIREMENTS:**

It is unlawful for a person to use a shrimp trawl in coastal fishing waters **without a second Authorized North Carolina Division of Marine Fisheries (NCDMF) Bycatch Reduction Device(s) (BRD)** as outlined in Section I. **OR** an additional Ancillary BRD, both operational and properly installed in each net. Ancillary BRDs include:

- A. Reduced bar spacing in a TED, to be considered ancillary BRD the bar spacing in the TED shall not exceed three inches from inside edge to inside edge of bars.
- B. If the primary BRD is a Florida Fish Excluder (Section I. A.), and the second authorized BRD is a FFE then the second Florida Fish Excluder shall be installed in accordance with section I.A. with the exception that the second FFE can be installed no further forward than 5 meshes from the apex of the primary FFE and the same distance from the centerline as the primary FFE with the apex of the second FFE facing the headrope of the trawl and shall be exempt from requirement I.A.5. as to the 65% placement of the FFE.
- C. A T-90 or square mesh (T-45) cod end shall be installed in a minimum of ½ the effective cod end length.

- D. T-90 or square mesh (T-45) panels shall be constructed with a minimum of 2 inch stretched mesh, cover a minimum of the top 1/3 of the effective circumference of the cod end, be a minimum of 3 feet in length, and shall be installed no further forward than 6 feet from the cod end tie-off rings.

III. **EXEMPTIONS:**

These BRD restrictions do not apply to a single test trawl net (try net) with a headrope length of 16 feet or less, if it is operated under the following conditions:

- A. net is either pulled immediately in front of another net or is not connected to another net in any way;
- B. no more than one net is used at a time; and
- C. net is not towed as a primary net.

IV. **DEFINITIONS:** For the purposes of this proclamation, the following terms are hereby defined:

- A. Bycatch reduction device (BRD) - any gear or trawl modification (including modifications to a TED that would enhance finfish exclusion) designed to allow finfish to escape from a shrimp trawl. BRD is defined based on its ability to facilitate the escape of finfish from a shrimp trawl.
- B. Turtle Excluder Device (TED) - An inclined grid or netting panel that prevents the passage of large animals such as sea turtles and large fish into the cod end and guides them through an escape opening located in the cod end. TED is defined based on its ability to exclude sea turtles from a shrimp trawl.
- C. Tail bag/Cod end - That portion of the trawl net at which the trawl bodies taper ends and the straight extension begins, extending to the terminal end of the trawl.
- D. Functional Cod end Length - That length of the cod end of a trawl beginning at the cod end tie-off rings and extending forward for a maximum of 105 meshes or to the point where the straight extension ends and the trawl body taper begins, whichever is less. Trawls utilizing short cod ends may include those meshes of the TED extension that are behind the TED grid and are in-line with the center of the FFE escape opening.
- E. Centerline - The line running from the center point of the headrope to the top center of the end of the cod end.
- F. T-90 – Webbing turned 90°.

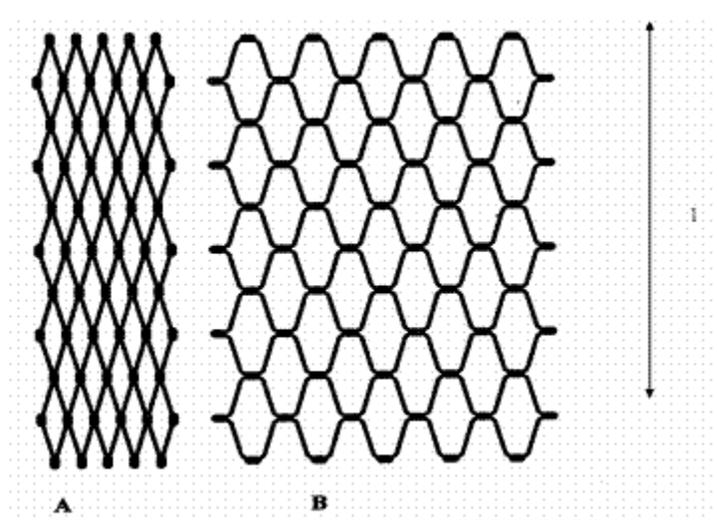


Illustration of (A) traditional (T-0) webbing and (B) T-90 webbing.

- G. Square mesh panel (T-45) – Webbing turned 45°, such that panels are sewed in with the bar width facing the headrope.

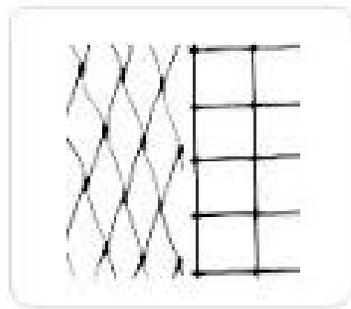


Illustration of traditional (T-0) webbing and square mesh (T-45) webbing.

V. GENERAL INFORMATION:

- A. This proclamation is issued under the authority of N.C.G.S. 113-170.4; 113-170.5; 113-182; 143B-289.52 and N.C. Marine Fisheries Rule 15A NCAC 3J .0104(d).
- B. The Florida Fish Excluder (I. A.) is measured diagonally from inside one corner edge to the inside edge of the opposite corner while the Fisheye (I.B.) and the Gulf Fisheye (I.C) are measured by measuring two inside leg lengths and multiplying those two distances to calculate the total square inches of the opening.
- C. It is unlawful to violate the provisions of any proclamation issued by the Fisheries Director under his delegated authority per N.C. Fisheries Rule 15A NCAC 3H .0103.
- D. Channel nets, float nets, fixed nets, and butterfly nets are not required to use BRDs.

- E. The intent of this proclamation is to allow federal approved bycatch reduction devices to be approved as state bycatch reduction devices and to require a second authorized BRD in accordance with the N.C. Shrimp Fishery Management Plan Amendment 1.
- F. Persons wishing to test BRD designs not covered by this proclamation may submit BRD designs to the NCDMF, Morehead City office, for consideration for field-testing.
- G. Contact N.C. Division of Marine Fisheries, P.O. Box 769, Morehead City, NC 28557 252-726-7021 or 800-682-2632 for more information or visit the division website at <http://portal.ncdenr.org/web/mf/>.
- H. For more information on the installation of the Modified Jones Davis BRD visit: http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/documents/pdfs/brds/mod_jones_davis_instructions.pdf and for more information on the installation of the Composite Panel BRD visit: http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/documents/pdfs/brds/composite_brd_instructions.pdf.
- I. In accordance with N.C. General Statute 113-221.1(c) All persons who may be affected by proclamations issued by the Fisheries Director are under a duty to keep themselves informed of current proclamations.
- J. This proclamation supersedes Proclamation SH-3-2012, dated May 22, 2012. **There are significant changes in that additional Bycatch Reduction Devices are now approved for use in Coastal Fishing Waters and a second Bycatch Reduction Device is required.**

BY: _____

Dr. Louis B. Daniel III, Director
DIVISION OF MARINE FISHERIES

May 12, 2015
12:00 P.M.
SH-2-2015
/KB/sab

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Table 1. Required placement of Florida Fish Excluders (FFE).

Functional Cod end Length *	Maximum FFE Placement**	Functional Cod end Length&	Maximum FFE Placement**
105 meshes or greater	68 meshes	82	53
104	68	81	53
103	67	80	52
102	66	79	51
101	66	78	51
100	65	77	50
99	64	76	49
98	64	75	49
97	63	74	48
96	62	73	47
95	62	72	47
94	61	71	46
93	60	70	46
92	60	69	45
91	59	68	44
90	59	67	44
89	58	66	43
88	57	65	42
87	57	64	42
86	56		
85	55		
84	55		
83	54		

* Functional Cod end Length – That length of the cod end of a trawl beginning at the cod end tie-off and extending forward for a maximum of 105 meshes or to the point where the straight extension ends and the trawl body taper begins, whichever is less. Trawls utilizing short cod ends may include those meshes of the TED extension that are behind the TED grid and are in-line with the center of the FFE escape opening.

** If your cod end is not included in this Table, you can figure the maximum placement for your net by following the formula: (mesh count multiplied by 65, divided by 100, using a 50 mesh cod end as an example $(50 \times 65) / 100 = 32.5$).

Table 2. Required placement of “SEA EAGLE” Excluders.

Functional Cod end Length *	Maximum “SEA EAGLE” Placement**	Functional Cod end Length&	Maximum “SEA EAGLE” Placement**
105 meshes or greater	40 meshes	82	31
104	40	81	31
103	39	80	30
102	39	79	30
101	38	78	30
100	38	77	29
99	38	76	29
98	37	75	29
97	37	74	28
96	36	73	28
95	36	72	27
94	36	71	27
93	35	70	27
92	35	69	26
91	35	68	26
90	34	67	25
89	34	66	25
88	33	65	25
87	33	64	24
86	33		
85	32		
84	32		
83	32		

* Functional Cod end Length – That length of the cod end of a trawl beginning at the cod end tie-off and extending forward for a maximum of 105 meshes or to the point where the straight extension ends and the trawl body taper begins, whichever is less. Trawls utilizing short cod ends may include those meshes of the TED extension that are behind the TED grid and are in-line with the center of the “SEA EAGLE” escape opening.

** If your cod end is not included in this Table, you can figure the maximum placement for your net by following the formula: (mesh count multiplied by 38, divided by 100, using a 50 mesh cod end as an example: $(50 \times 38) / 100 = 19$).

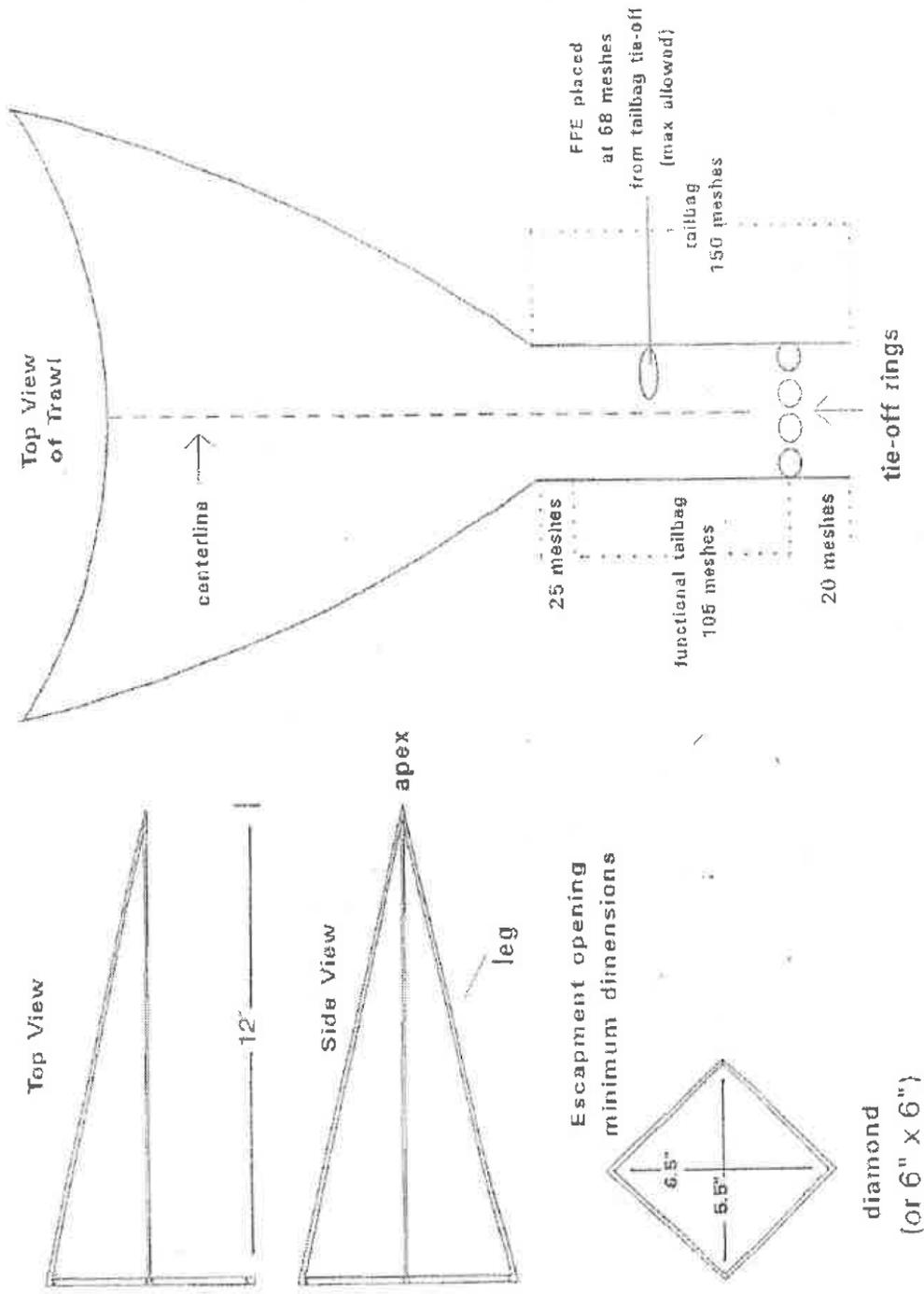


Figure 1. Diagram of Florida Fish Eye (FFE) (I.A.)

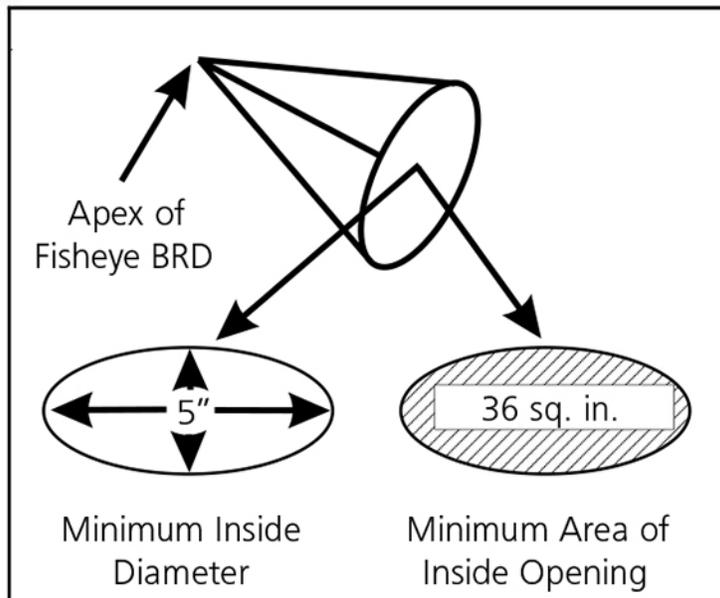


Figure 2. Minimum dimensions of the Fisheye (I.B.) and Gulf Fisheye (I.C.).

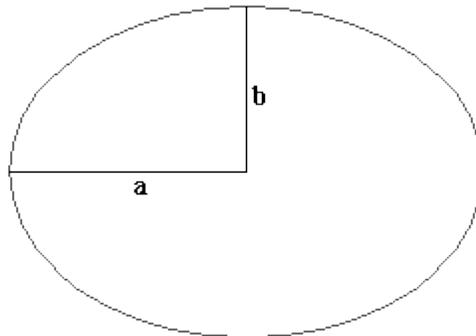


Figure 3. To determine the opening size of the oval Fisheye (I.B.) and the Gulf Fisheye (I.C.) use the following formula: $Area = \pi \times a \times b$

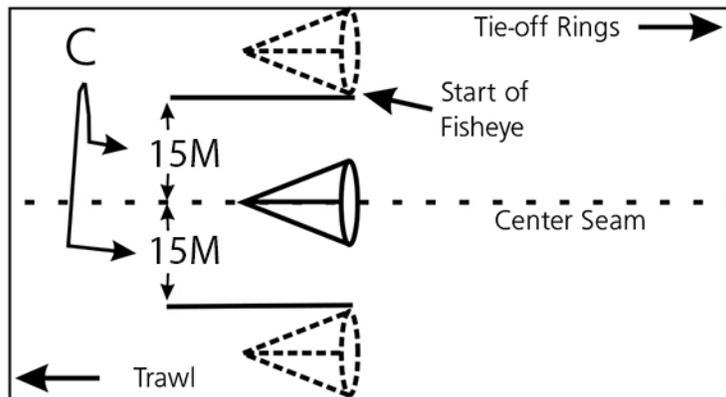


Figure 4. Placement of the Gulf Fisheye (I.C.) in relation to the center seam of the cod end.

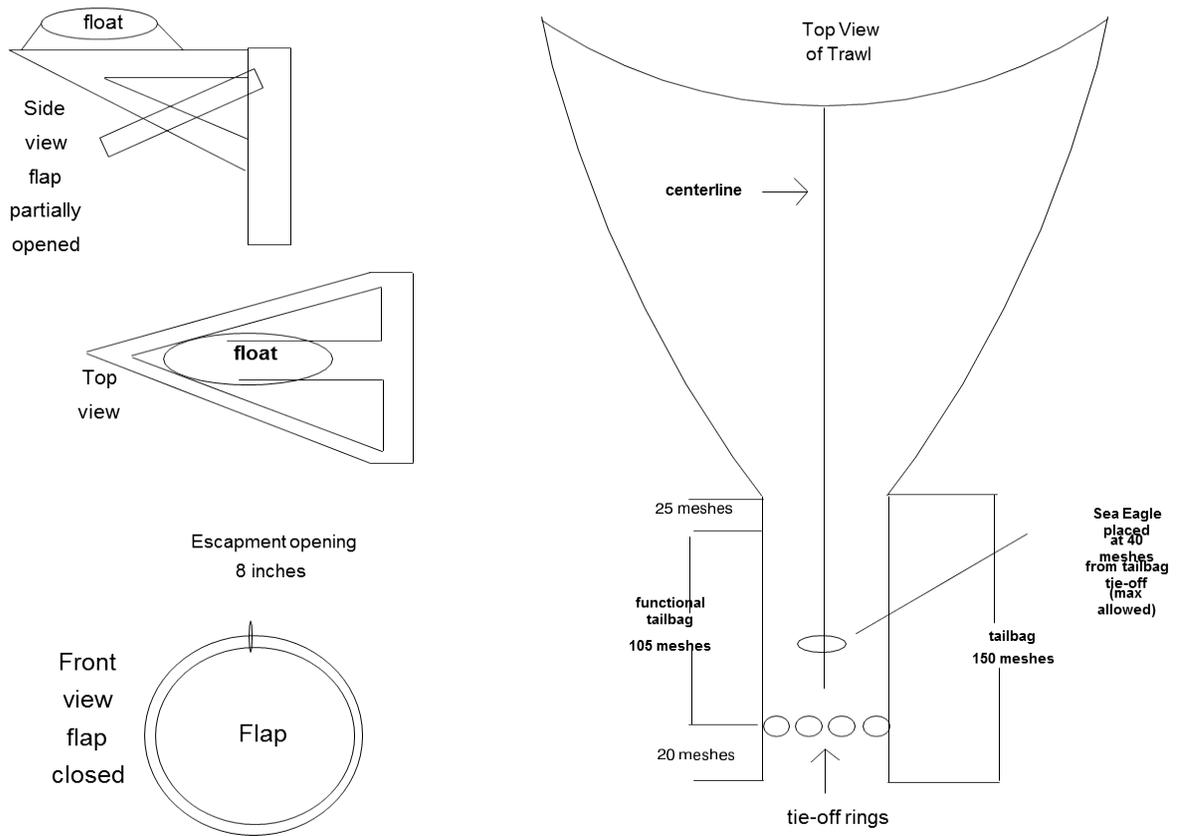
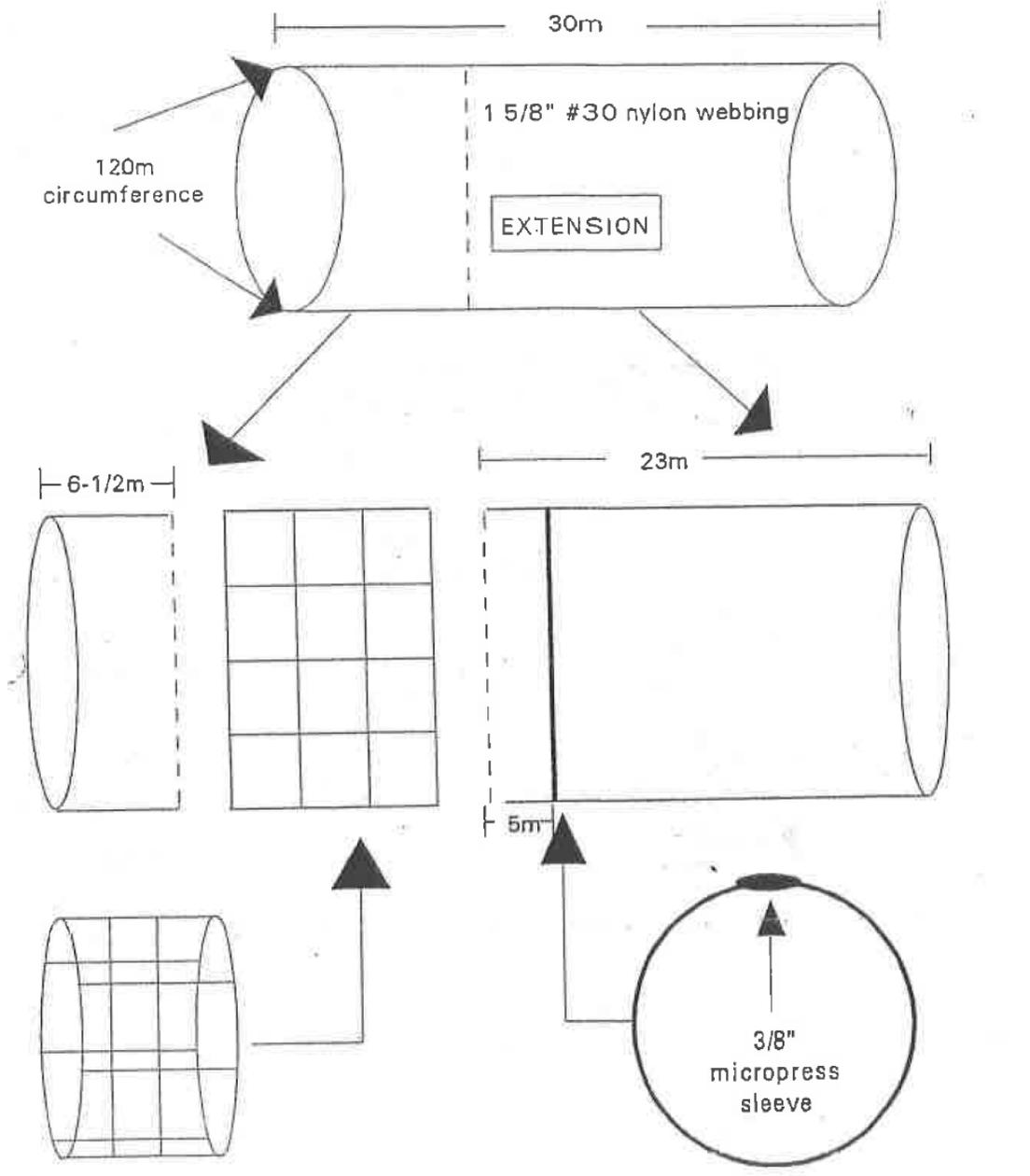


Diagram of "Sea Eagle" Fish Excluder.

Figure 5. Diagram of "Sea Eagle" Fish Excluder.

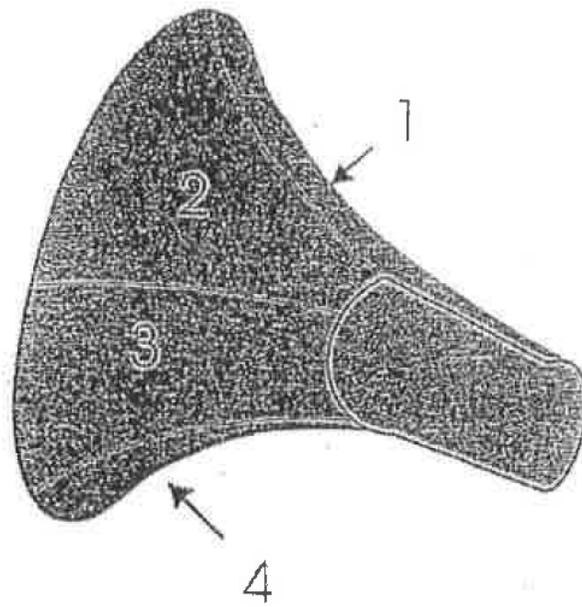


10" Large mesh
 19 meshes (95") by 3 meshes (15")
 or
 8" Large mesh
 23 meshes (95") by 4 meshes (15")

1/2" plastic coated cable
 ring circumference 94-1/4"

Figure 6. Diagram of the Large Mesh and Extended Mesh Funnel BRDs (I.E, I.F, and I.G.).

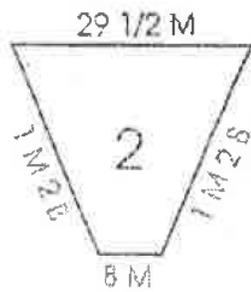
Funnel



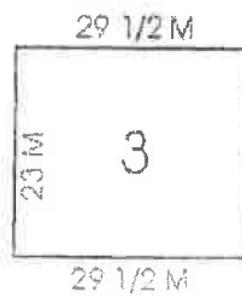
Side



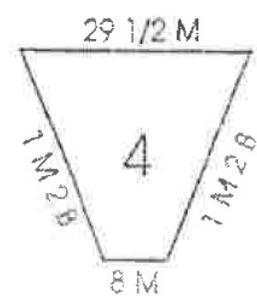
Top



Side



Bottom



Webbing Panels

Figure 7. Webbing panels of the Large Mesh and Extended Mesh Funnel BRDs (I.E., I.F. and I.G.).

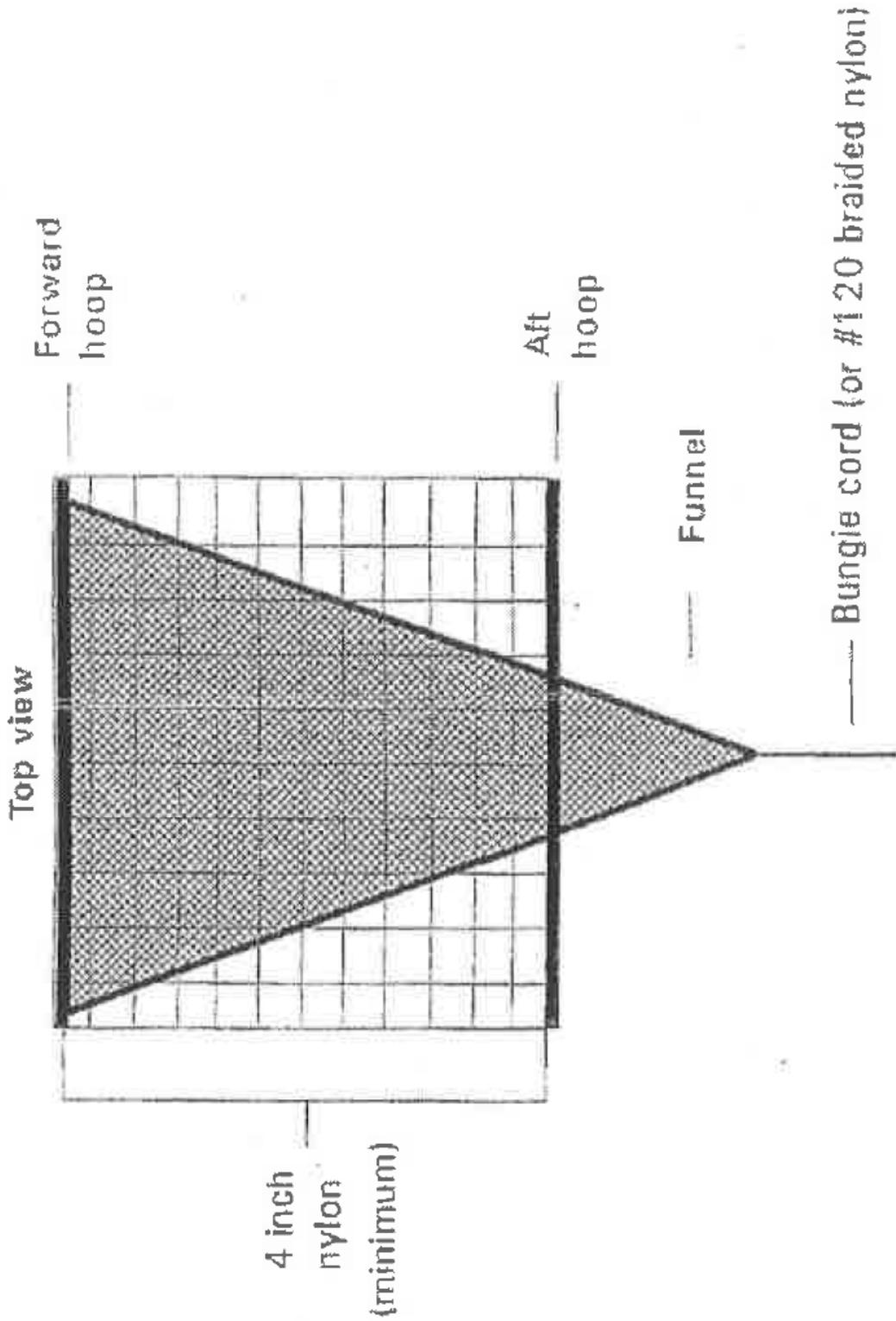
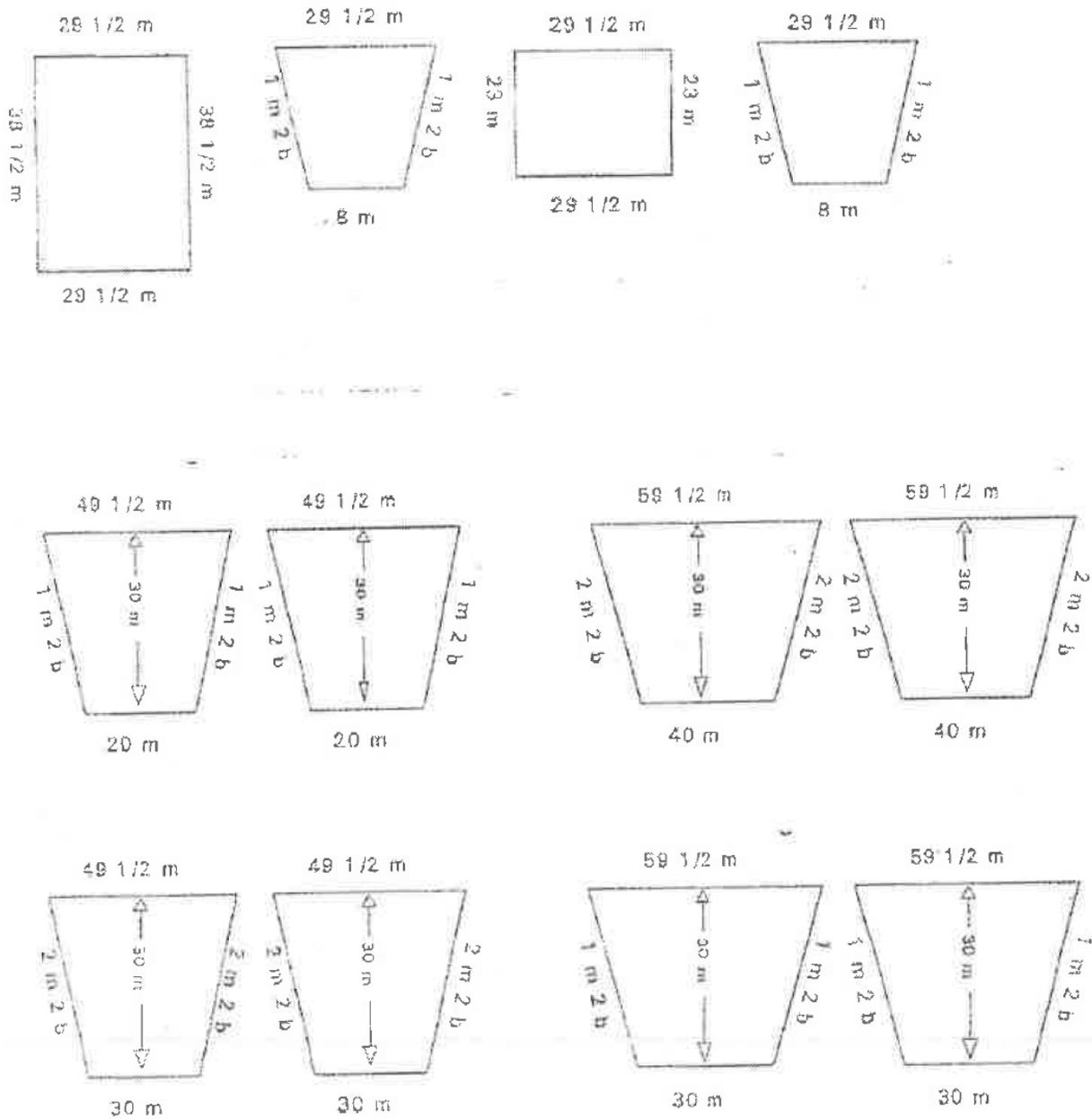


Figure 9. Diagram of the modified large mesh funnel excluder (LMFE) (I.G.)



* one of these four patterns may be used to construct the funnel for the large mesh funnel excluder.

Figure 10. Various funnel patterns of the Large Mesh Funnel Excluder (I.G.).