

**PART 52—[AMENDED]**

■ 1. The authority citation for part 52 continues to read as follows:

**Authority:** 42 U.S.C. 7401 *et seq.*

**Subpart Q—Iowa**

■ 2. In § 52.820 the table in paragraph (c) is amended by revising the entry in the Comments column for “Chapter V” under “Polk County” to read as follows:

**§ 52.820 Identification of plan.**

\* \* \* \* \*

(c) \* \* \*

**EPA—APPROVED IOWA REGULATIONS**

Iowa citation	Title	State effective date	EPA approval date	Comments
<b>Iowa Department of Natural Resources, Environmental Protection Commission [567]</b>				
*	*	*	*	*
<b>Polk County</b>				
Chapter V .....	Polk County Board of Health Rules and Regulations Air Pollution Chapter V.	4/15/1998 10/4/2000	1/09/04 FR page and cite	Article I, Board of Section 5–2, definition of “variance”; Article VI, Sections 5–16(n), (o) and (p); Article VIII, Article IX, Sections 5–27(3) and (4), Article XIII, and Article XVI, Section 5–75(b) are not a part of the SIP.

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**BILLING CODE 6560-50-P**

**DEPARTMENT OF COMMERCE****National Oceanic and Atmospheric Administration****50 CFR Part 622**

**[Docket No. 030908224-3325-02; I.D. 080403B]**

**RIN 0648-AM23**

**Fisheries of the Caribbean, Gulf of Mexico, and South Atlantic; Shrimp Fishery of the Gulf of Mexico; Amendment 10**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Final rule.

**SUMMARY:** NMFS issues this final rule to implement the approved measures of Amendment 10 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico (Amendment 10), as prepared and submitted by the Gulf of Mexico Fishery Management Council (Council). This final rule requires, with limited exceptions, the use of NMFS-certified bycatch reduction devices (BRDs) in shrimp trawls in the Gulf of Mexico exclusive economic zone (Gulf EEZ) east of 85°30' W. long. (approximately Cape San Blas, FL). In addition, this final rule identifies the certified BRDs currently authorized for use in the Gulf EEZ east

of 85°30' W. long. and modifies the *Gulf Of Mexico Bycatch Reduction Device Testing Protocol Manual* to reflect the specific bycatch reduction criterion applicable for certification of BRDs used in this area of the Gulf EEZ. The intended effect of this final rule is to reduce bycatch in the Gulf of Mexico shrimp fishery to the extent practicable.

**DATES:** This final rule is effective February 9, 2004.

**ADDRESSES:** The final regulatory flexibility analysis (FRFA) is available from the Southeast Regional Office, NMFS, 9721 Executive Center Drive N., St. Petersburg, FL 33702.

**FOR FURTHER INFORMATION CONTACT:** Dr. Steve Branstetter, telephone: 727-570-5305, fax: 727-570-5583, e-mail: [Steve.Branstetter@noaa.gov](mailto:Steve.Branstetter@noaa.gov).

**SUPPLEMENTARY INFORMATION:** The fishery for shrimp in the Gulf EEZ is managed under the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico (FMP). The FMP was prepared by the Council, approved by NMFS, and implemented under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) by regulations at 50 CFR part 622.

On August 14, 2003, NMFS announced the availability of Amendment 10 and requested comments on it (68 FR 48592). NMFS published the proposed rule to implement Amendment 10 and requested comments on the proposed rule through November 14, 2003 (68 FR 56252, September 30, 2003). NMFS partially approved Amendment 10 on November 2, 2003; the bycatch reporting methodology was disapproved based on

inconsistency with national standard 2. The rationale for the measures in Amendment 10 is provided in Amendment 10 and in the preamble to the proposed rule and is not repeated here.

**Comments and Responses**

NMFS received five comment letters during the public comment periods on the amendment and the proposed rule. The comments and NMFS' responses follow.

**Comment 1:** National standard 9 (NS9) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act requires that fishery management plans include conservation and management measures that shall, to the extent practicable, minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. Implementing bycatch reduction device (BRD) requirements for the eastern Gulf of Mexico would contribute to meeting that requirement.

**Response:** In partially approving the Council's Generic Sustainable Fisheries Act Amendment in 1999, NMFS concluded that bycatch was not reduced to the extent practicable for the entire Gulf of Mexico shrimp fishery because no bycatch reduction methods had been proposed for the eastern Gulf of Mexico. NMFS urged the Council to develop management actions to reduce bycatch in the shrimp fishery in the eastern Gulf of Mexico to be in compliance with NS9. NMFS partially approved Amendment 10 on November 2, 2003, including approval of the proposed action to require BRDs in the eastern

Gulf of Mexico. Promulgation of this final rule gives effect to that decision.

**Comment 2:** The bycatch reporting methodology proposes to use fishery independent data, where data are collected using single nets equipped without turtle excluder devices (TEDs) or BRDs. This bi-annual fishery-independent survey does not include sampling in the eastern Gulf of Mexico. Recent studies have demonstrated that current shrimp fishing effort data do not appear to have the spatial accuracy necessary for the estimation of bycatch. More accurate estimates of bycatch in the shrimp fishery could be generated by the use of logbooks, an observer program, and a better approach to measure shrimp fishery effort in the Gulf of Mexico.

**Response:** NMFS partially approved Amendment 10 on November 2, 2003. In a letter explaining its rationale for the partial approval of the actions in the amendment, NMFS informed the Council that the proposed bycatch reporting methodology ignored the large database of catch and bycatch in the fishery that has been documented by observers since the 1980s, and, thus, any estimates derived from the Council's proposed methodology would not be based on the best available scientific information. NMFS has recommended to the Council that the most scientifically valid estimates of bycatch catch-per-unit-effort in the Gulf of Mexico shrimp trawl fishery would be generated by using a combination of the fishery-independent (SEAMAP survey) and fishery dependent (observer) data. NMFS' best available estimates of shrimp fishing effort, and any other relevant data sources that might become available. The Council is already considering alternative methods of assessing bycatch in the Gulf of Mexico shrimp fishery for inclusion in Amendment 13 to the FMP, which is currently under development and consideration.

**Comment 3:** The reduced revenues being reported by shrimp vessel owners are inaccurate. No one verifies those income figures. Therefore, the economic concerns of the fishery in regards to the proposed actions should be discounted.

**Response:** Economic impacts to the shrimp fishery and estimated per-vessel revenues, in regards to the proposed actions, are not based on any declaration of income by the shrimp vessel owners. Per-vessel revenues are based on the number of vessels known to be operating in the area and the quantity and value of the shrimp products landed that were reported to be caught in the affected area. Economic impacts of the proposed action are then

calculated from, among other things, the purchase and installation costs of the BRDs and the potential for shrimp loss attributable to the use of the BRDs in the affected area.

**Comment 4:** One respondent suggested that the economic impact analysis conducted for the rule contained a discrepancy between the estimated revenue loss and the estimates of shrimp loss due to BRDs, presented questionable estimates of current performance for the average shrimp trawler and estimates of average annual revenue loss within the fishery, and over-estimated gear-up costs of approximately \$200 per vessel. It is intuitively discordant to accept that any small or family business would operate for any length of time at a loss. NMFS should report net cash flow from shrimping operations to vessel owners in order to draw proper conclusions, including any going-out-of-business projections or statements, regarding what the true economic consequences would be to those vessel owners from implementation of the proposed rule. In summary, it appears that the costs to the industry were nominal compared to the benefits that would be derived from reducing finfish bycatch in the fishery.

**Response:** NMFS prepared a "Supplemental Economic Analysis for Amendment 10 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters," (SEA). The SEA acknowledges that there will be substantial reductions in bycatch, and that the ecosystem and societal benefits of the rule justify its implementation; nevertheless, NMFS is obligated to identify the adverse impacts that participants in the shrimp trawl fishery are likely to experience. To assess those impacts the SEA utilized the General Bioeconomic Simulation Model of the Gulf shrimp fishery (GBFSM). The GBFSM is a nationally recognized and extensively reviewed model of the fishery and, as such, represents the best available analytical model for the determination of the expected impacts of proposed actions for this fishery.

Footnote "i" of the SEA notes that the model utilizes a more complex and dynamic procedure that captures the interactions of shrimp harvest—in both abundance and size—according to species, area, depth and vessel class for estimating revenue loss rather than simply reducing harvest by a fixed percent. This results in revenue losses that exceed shrimp loss and provides a more accurate assessment of expected shrimp revenue losses. With regards to the estimates of current performance of shrimp trawlers, NMFS believes that the

assessment accurately portrays the fleet and is consistent with the conclusion that many participants will leave the fishery as a result of the poor economic conditions. It should be clear, however, that the statements refer to the average shrimp trawler, and the assessment does not conclude that all entities are equally unprofitable. In regard to a "net cash flow" approach, the GBFSM does not consider depreciation, and, in fact, estimates profits (losses) in a manner very similar to the suggested "net cash flow" approach. Finally, NMFS disagrees that gear-up costs are overstated. Available data suggest that the current average cost per BRD is approximately \$50. Total nets for a vessel would be expected to range from 2 nets for a small vessel with no spares to 8 nets for a large vessel with a complete set of spares (4 nets and 4 spares). The assessment assumes average gear-up costs at \$200 per vessel, when, in fact, costs could be as high as \$400 for the large shrimp trawls. The assumption of lower average gear-up costs would imply no spares and/or an unrealistically low price per BRD. The figures reported in the assessment and the assumption that multiple BRDs are necessary are, therefore, concluded to more realistically capture expectations.

**Comment 5:** Two respondents made suggestions for additional management measures that should be considered to reduce bycatch in the shrimp fishery and improve bycatch estimations. One respondent supported the establishment of marine protected areas and reduced quotas for all fisheries. One respondent suggested that the Council reconsider alternatives that were considered but rejected in the amendment, such as closed areas, closed seasons, and bycatch quotas, and address research needs to better establish bycatch estimates.

**Response:** NMFS and the Council have established numerous closed areas in the Gulf of Mexico. These areas have been determined to be especially sensitive to the impacts of fishing or are especially important to various marine resources (e.g. spawning area closures). In Amendment 10, the GMFMC rejected alternatives to seasonally or permanently close additional areas, concluding that the use of BRDs in all areas all year would provide greater biological benefits. Previous evaluations of the benefits of seasonal area closures indicate that effort is not reduced; effort is transferred to areas that remain open. Thus, overall impacts to bycatch are not substantially altered. As noted in the response to Comment 2, the Council is currently considering additional alternatives to address bycatch

reporting, such as bycatch quotas, in developing Amendment 14. In regards to quota reductions, the shrimp fishery is not managed by quotas, and reducing quotas on all fisheries is beyond the scope of the proposed actions. NMFS and the Council carefully monitor the status of the stocks in each fishery and establish quotas based on the status of each stock. These quotas allow continued harvest without overfishing the available resource.

### Classification

The Administrator, Southeast Region, NMFS, determined that the approved measures of Amendment 10 are necessary for the conservation and management of the Gulf shrimp fishery and that the approved measures are consistent with the Magnuson-Stevens Act and other applicable laws.

This final rule has been determined to be not significant for purposes of Executive Order 12866.

NMFS prepared a FRFA, based on the RIR, for this final rule. A summary of the FRFA follows:

The objective of this rule is to further reduce bycatch in the Gulf shrimp fishery to the extent practicable. The rule will require the use of BRDs in all NMFS statistical areas (areas 1 through 8) of the eastern Gulf of Mexico EEZ. The Magnuson-Stevens Act, as amended, provides the statutory basis for the rule.

No changes were made in the final rule as a result of public comments.

No duplicative, overlapping, or conflicting Federal rules have been identified. The rule will not require any reporting or record-keeping or other compliance requirements other than the requirement to use BRDs. The use and maintenance of BRDs will not require professional skills that materially differ from the skills required to operate a shrimp trawl vessel.

In 2001, approximately 946 shrimp trawl fishing craft were known to operate in statistical areas 1 through 8 off the west coast of Florida and will be affected by the rule. Within this group of affected entities, 460 operate in statistical areas 1 through 3, 283 operate in statistical areas 4 and 5, and 592 operate in statistical areas 6 through 8. Of these 946 shrimp trawlers, 736 craft are Coast Guard-registered vessels and 210 are state-registered boats; 474 are considered large vessels, while 472 are considered small vessels/boats; 868 (91.8 percent) shrimp trawlers landed shrimp in Florida, 102 landed shrimp in Alabama, 4 landed shrimp in Mississippi, and 31 landed shrimp in Texas; 49 landed in both Florida and Alabama, 7 landed in both Florida and

Texas, and 1 each landed in Mississippi/Florida and Alabama/Texas.

Overall, average gross revenue per shrimp trawler from areas 1 through 8 is \$26,440. Average total costs per shrimp trawler are \$38,991, resulting in an average annual loss of \$12,551. The average number of crew is 2.3 for small shrimp trawlers and 3.5 for large shrimp trawlers, resulting in an overall average of 2.9 crew per trawler. Each small trawler is assumed to use two nets, each large trawler is assumed to use 4 nets and, in each case, each trawler is assumed to have at least one spare set of nets. A commercial fishing business is considered a small entity if it is independently owned and operated, is not dominant in its field of operation, has annual gross revenues less than or equal to \$3.5 million. Based on the information provided above, all harvesting operations within this fishery are determined to be small entities.

In addition to commercial shrimp trawlers, 61 shrimp dealers will be affected by the rule. Average Gulf shrimp purchases per dealer is \$2,029,221, with an average of \$692,622 coming from harvests in areas 1 through 8. Employment data within the dealer sector are sparse. However, for 12 of the affected shrimp dealers, the number of employees ranges from 1 to 168, with an average of 37 employees. Further, only the single, largest shrimp processor in the Gulf employed more than 500 workers on average per year. Since shrimp dealers are typically smaller operations than shrimp processors in terms of volume and employment, it can be assumed that all dealers affected by the rule employ less than 500 workers per year on average. A dealer is considered a small business entity if it employs less than or equal to 500 employees. All of the 61 shrimp dealers are, therefore, assumed to be small entities.

Since all shrimp harvest and dealer operations affected by the rule are determined to be small entities, the issue of disproportional effects between small and large entities does not arise.

As previously stated, the average gross revenue per shrimp trawler is estimated to be \$26,440, and the average annual profit is negative, estimated to be a loss of \$12,551. Under the rule, the average reduction in revenue and profits per shrimp trawler is estimated to be \$1,444 and \$1,112, or reductions of 5.5 percent and 8.9 percent, respectively. Detailed break-outs of impacts by vessel size category, area of fishing, and state of landing are provided in the FRFA and are generally representative of the results presented in this summary. However, for shrimp trawlers that

operate primarily in lower Florida, particularly large shrimp trawlers, the percentage increase in annual losses due to the rule likely ranges from 9.2 percent to as much as 23.4 percent.

In order for a firm to continue operating, in the short-run, revenues must at least cover variable costs where variable costs are those costs that change with the amount of fishing activity. Due to the large losses throughout the west Florida shrimp fishery, many shrimp trawlers cannot currently cover their variable costs. Additional costs stemming from new regulatory burdens would accelerate the rate at which these vessels are forced to shut down. It is not possible, however, to accurately determine how many operations, if any, will, in fact, shut down as a result of the rule.

In terms of the value of shrimp purchases, the loss per dealer is estimated to be \$22,393, which represents an average of 1.1 percent for all dealers, but 2 percent for dealers in Florida. Since profitability is unknown for this sector, the significance of such losses cannot be determined with certainty. However, given that the number of dealers purchasing shrimp from the west Florida fishery declined from 84 in 1998 to 61 in 2001, and the poor economic health of the harvesting sector, it seems likely that losses are being incurred in the dealer sector. Dealers in Key West, Ft. Myers Beach, Tampa, St. Petersburg, and Tarpon Springs, FL will likely be most susceptible to potential impacts of the rule.

Significant alternatives to the rule include area closures, seasonal closures, and modifications to BRD requirements. The rule will retain the status quo area and seasonal closures and, thus, impose no additional adverse economic impacts on small entities associated with these types of management measures. With regards to BRD requirements, two alternatives would require BRDs over the identical geographic range, statistical areas 1 through 8, and would not reduce the expected negative economic impacts. Two alternatives would limit the BRD requirement to statistical areas 4 through 8 and would significantly reduce the negative economic impacts attributable to the rule. Two other alternatives, the status quo, which would not require BRDs, and an alternative that would limit the requirement to statistical areas 6 through 8, would further reduce the negative economic impacts of the rule. However, none of these alternatives would satisfy the requirement and the Council's intent to minimize bycatch "to the extent practicable." Of the

various alternatives that require BRDs, the rule would accomplish the greatest total bycatch reduction since BRDs will be required over a greater geographic range. Requiring BRDs over statistical areas 1–8 will result in the bycatch reduction of approximately 4.006 million lb (1.817 million kg), whereas requiring BRDs in only statistical areas 4–8 would result in the bycatch reduction of approximately 1.91 million lb (0.87 million kg).

Copies of the FRFA and RIR are available upon request (see **ADDRESSES**).

#### List of Subjects in 50 CFR Part 622

Fisheries, Fishing, Puerto Rico, Reporting and recordkeeping requirements, Virgin Islands.

Dated: January 5, 2004.

**Rebecca Lent,**

*Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.*

■ For the reasons set out in the preamble, 50 CFR part 622 is amended as follows:

#### PART 622—FISHERIES OF THE CARIBBEAN, GULF, AND SOUTH ATLANTIC

■ 1. The authority citation for part 622 continues to read as follows:

**Authority:** 16 U.S.C. 1801 *et seq.*

■ 2. In § 622.41, paragraphs (h)(1) and (2) are revised to read as follows:

##### § 622.41 Species specific limitations.

\* \* \* \* \*

(h) \* \* \*

(i) *BRD requirement*—(i) *West of 85°30' W. long.* On a shrimp trawler in the Gulf EEZ west of 85°30' W. long. and shoreward of the 100-fathom (183-m) depth contour, each net that is rigged for fishing must have a certified BRD listed in paragraph (h)(2)(i) of this section installed, unless exempted as specified in paragraphs (h)(1)(iii) through (v) or paragraph (h)(3)(iii) of this section.

(ii) *East of 85°30' W. long.* On a shrimp trawler in the Gulf EEZ east of 85°30' W. long., each net that is rigged for fishing must have a certified BRD listed in paragraph (h)(2)(ii) of this section installed, unless exempted as specified in paragraphs (h)(1)(iii) through (v) or paragraph (h)(3)(iii) of this section.

(iii) A shrimp trawler is exempt from the requirement to have a certified BRD installed in each net provided that at least 90 percent (by weight) of all shrimp on board or offloaded from such trawler are royal red shrimp.

(iv) A shrimp trawler is exempt from the requirement to have a BRD installed in a single try net with a headrope

length of 16 ft (4.9 m) or less provided the single try net is either pulled immediately in front of another net or is not connected to another net.

(v) A shrimp trawler is exempt from the requirement to have a certified BRD installed in up to two rigid-frame roller trawls that are 16 ft (4.9 m) or less in length used or possessed on board. A rigid-frame roller trawl is a trawl that has a mouth formed by a rigid frame and a grid of rigid vertical bars; has rollers on the lower horizontal part of the frame to allow the trawl to roll over the bottom and any obstruction while being towed; and has no doors, boards, or similar devices attached to keep the mouth of the trawl open.

(vi) A trawl net is rigged for fishing if it is in the water, or if it is shackled, tied, or otherwise connected to a sled, door, or other device that spreads the net, or to a tow rope, cable, pole, or extension, either on board or attached to a shrimp trawler.

(2) *Certified BRDs.* The following BRDs are certified for use by shrimp trawlers in the respective areas of the Gulf EEZ specified in paragraphs (h)(2)(i) and (ii) of this section. Specifications of these certified BRDs are contained in appendix D to this part.

- (i) *West of 85°30' W. long.*
  - (A) Fisheye.
  - (B) Gulf fisheye.
  - (C) Jones-Davis.
- (ii) *East of 85°30' W. long.*
  - (A) Fisheye.
  - (B) Gulf fisheye.
  - (C) Jones-Davis.
  - (D) Extended funnel.
  - (E) Expanded mesh.

\* \* \* \* \*

**Note:** The *Gulf Of Mexico Bycatch Reduction Device Testing Protocol Manual* and appendices H and I to the Manual are published as appendices to this document. These appendices will not appear in the Code of Federal Regulations.

#### Appendix—Gulf of Mexico Bycatch Reduction Device Testing Protocol Manual

##### Definitions

*Bycatch reduction criterion* means—

(1) In the Gulf EEZ west of 85°30' W. long., that the BRD reduces the mortality of juvenile (age 0 and age 1) red snapper by a minimum of 44 percent from the average level of bycatch mortality ( $F=2.06$ ) on these age classes during the years 1984–1989.

(2) In the Gulf EEZ east of 85°30' W. long., that the BRD reduces the bycatch of total finfish by at least 30 percent by weight.

*Bycatch reduction device (BRD)* is any gear or trawl modification designed to allow finfish to escape from a shrimp trawl.

*BRD candidate* is a bycatch reduction device to be tested for certification for use in the commercial shrimp fishery of the Gulf of Mexico.

*Catch per unit of effort (CPUE)* means the number or pounds of fish (e.g., red snapper) or shrimp taken during a pre-defined measure of fishing activity (e.g., per hour).

*Certification phase* is a required testing phase whereby an individual so authorized by the RA may conduct a discrete testing program, with a sample size adequate for statistical analysis (no less than 30 tows), to determine whether a BRD candidate meets the bycatch reduction criterion.

*Certified BRD* is a BRD that has been tested according to this protocol and has been determined by the RA as having met the bycatch reduction criterion.

*Control trawl* means a trawl used during the certification testing that is not equipped with a BRD. The catch of this trawl is compared to the catch of the experimental trawl.

*Experimental trawl* means the trawl used during the certification tests that is equipped with the BRD candidate.

*Evaluation and oversight personnel* includes scientists, observers, and other technical personnel who, by reason of their occupational or other experience, scientific expertise or training, are approved by the RA as qualified to evaluate and oversee the application and testing process. Scientists and other technical personnel will (1) review a BRD certification test application for its merit, and (2) critically review the scientific validity of the certification test results.

*Observer* means a person on the list maintained by the RA of individuals qualified to supervise and monitor a BRD certification test. Applicants may obtain the list of individuals qualified to be an observer from the RA. The observer chosen by the applicant may not have any current or prior financial relationship with the entity seeking BRD certification. For information on observer qualification criteria and the observer application process, see Appendix I.

*Pre-certification phase* is an optional testing phase whereby an individual, so authorized by the RA, can experiment with the design, construction, and configuration of a BRD and gather data.

*Regional Administrator (RA)* means the Southeast Regional Administrator, National Marine Fisheries Service, 9721 Executive Center Drive North, St. Petersburg, FL 33702, phone 727-570-5301.

*Required measurements* refers to the quantification of the dimensions and configuration of the trawl, the BRD candidate, the doors, the location of the BRD in relation to other parts of the trawl gear, and other quantifiable criteria used to assess the performance of the BRD candidate.

*Sample size* means the number of successful tows (a minimum of 30 tows per test are required).

*Shrimp loss* means the percent difference in average CPUE (e.g. kg/hr) between the amount of shrimp caught in the control trawl and the amount of shrimp caught in the experimental trawl.

*Successful tow* means that the control and experimental trawl were fished in accordance with the requirements set forth in the protocol and the terms and conditions of the letter of authorization; that no indication exists that problematic events, such as those

listed in Appendix D-5, occurred during the tow which would impact or influence the fishing efficiency (catch) of one or both nets; and, in the Gulf EEZ west of 85°30' W. long., that the control or experimental net caught at least five red snapper during the tow.

*Tow time* means the total time (hours and minutes) an individual trawl was fished while being towed (*i.e.*, the time between "dog-off" and start of haul back).

*Trawl* means a net and associated gear and rigging, as illustrated in Appendix B-5 of this manual, used to catch shrimp. The terms trawl and net are used interchangeably throughout the manual.

*Tuning a net* means adjusting the trawl and its components to minimize the differences in shrimp catch between the two nets that will be used as the control and experimental trawls during the certification tests.

## I. Introduction

### Purpose of the Protocol

This protocol sets forth a standardized scientific procedure for the testing of a BRD candidate and for the evaluation of its ability to meet the bycatch reduction criterion. For a BRD candidate to be certified by the RA, the BRD candidate must meet the bycatch reduction criterion.

There are two phases to this procedure: An optional, but recommended, pre-certification phase and a required certification phase. An applicant is encouraged to take advantage of the pre-certification phase which allows experimentation with different BRD designs and configurations prior to certification phase testing (see below for details). The certification phase requires the applicant to conduct a discrete testing program, with a sample size of no less than 30 tows to determine whether the BRD candidate meets the bycatch reduction criterion. There is no cost to the applicant for the RA's administrative expenses such as preparing applications, issuing letters of authorization (LOAs), or evaluating test results or certifying BRDs. However, all other costs associated with either phase (*e.g.*, field testing) are at the applicant's expense.

## II. Pre-Certification Phase (Optional)

The pre-certification phase provides a mechanism whereby an individual can experiment with the design, construction, and configuration of a prototype BRD for up to 60 days to improve the design's effectiveness at reducing bycatch and to determine whether it is likely to meet the bycatch reduction criterion. To conduct pre-certification phase evaluations of a prototype BRD, the applicant must apply for, receive, and have on board the vessel during testing, an LOA from the RA.

### A. Application

In order to obtain an LOA to conduct pre-certification phase evaluations of a prototype BRD, an individual must submit a complete application to the RA. A complete application consists of a completed application form, Application to Test A Bycatch Reduction Device in the Exclusive Economic Zone (the form is appended as Appendix J-1), and the following: (1) A brief statement of the purpose and goal of the

activity for which the LOA is requested; (2) a statement of the scope, duration, dates, and location of the testing; (3) an 8.5-inch x 11-inch (21.6-cm x 27.9-cm) diagram drawn to scale of the BRD design; (4) an 8.5-inch x 11-inch (21.6-cm x 27.9-cm) diagram drawn to scale of the BRD and approved TED in the shrimp trawl; (5) a description of how the BRD is supposed to work; (6) a copy of the testing vessel's documentation or its state registration; and (7) a copy of the vessel's Federal shrimp permit.

An applicant requesting a pre-certification LOA of an unapproved hard or soft TED as a BRD must first apply for and obtain from the RA an experimental TED authorization pursuant to 50 CFR 223.207(e). The pre-certification phase LOA application must also append a copy of that authorization.

### B. Issuance

The RA will review the application for completeness. If the application is incomplete, the RA will inform the applicant of the incompleteness and give the applicant an opportunity to cure. If incompleteness is not cured within 30 days, the application will be returned to the applicant. Upon receipt of a complete application, the RA will issue a LOA to conduct pre-certification phase testing upon the vessel specified in the application if the BRD design is substantially unlike BRD designs previously determined not to meet the current performance criterion, or if the design is substantially similar to BRD designs previously determined not to meet the current performance criteria and the application demonstrates that the design could meet the bycatch reduction criterion through design revision or upon retesting (*e.g.*, the application shows that statistical results could be improved upon retesting by such things as a larger sample size than that previously used). If a pre-certification phase LOA is denied, the RA will return the application to the applicant along with a letter of explanation including relevant recommendations as to curing the deficiencies which caused the denial. In arriving at a decision, the RA may consult with evaluation and oversight personnel.

Issuance of a LOA allows the applicant to remove or disable the existing BRD in one net (to create a control net), and to place the prototype BRD in another net in lieu of a certified BRD (to create an experimental net). All other trawls under tow during the test must be equipped with a certified BRD. All trawls under tow during the pre-certification phase tests must be equipped with an approved TED unless operating under an authorization issued pursuant to 50 CFR 223.207(e). The LOA, and experimental TED authorization if applicable, must be on board the vessel while the pre-certification phase tests are being conducted. The term of the LOA will be 60 days.

### C. Applicability

The pre-certification phase allows an individual to compare the catches of a control net to the catches of the experimental net (net equipped with the prototype BRD) to estimate the potential efficiency of the prototype BRD. If that individual

subsequently applies for a certification phase LOA to test this design, he/she must include the results of the pre-certification phase evaluation with the certification application. The RA will use this information to determine if there is a reasonable scientific basis to conduct certification phase testing. Therefore, for each paired tow, the applicant should keep a written record of the weight of the shrimp catch, the weight of the finfish catch, and, if the testing is related to potential certification of the BRD for use in the Gulf EEZ west of 85°30' W. long., the total catch (in numbers) of red snapper of each net. The form contained in Appendix D should be used to record this information.

## III. Certification Phase (Required)

In order to have a BRD certified, it must, under certification phase testing, be consistent with the requirements of the testing protocol and LOA and be determined by the RA to meet the bycatch reduction criterion.

### A. Application

To conduct certification phase testing, an individual must obtain a certification phase LOA. To obtain a certification phase LOA, an individual must submit a complete application to the RA. The complete test application consists of an Application to Test A Bycatch Reduction Device in the Exclusive Economic Zone (Appendix J-1), a copy of the vessel's current Coast Guard certificate of documentation or, if not documented, its state registration certificate; a copy of the vessel's Federal shrimp permit; the name of a qualified observer who will be on board the vessel during all certification test operations (*see* Appendix I); and a test plan showing: (1) An 8.5-inch x 11-inch (21.6-cm x 27.9-cm) diagram drawn to scale of the BRD candidate; (2) an 8.5-inch x 11-inch (21.6-cm x 27.9-cm) diagram drawn to scale of the BRD candidate and approved TED in the shrimp trawl; (3) a description of how the BRD candidate is supposed to work; (4) the results of previous pre-certification phase tests; (5) the location, time, and area where the certification phase tests would take place; and (6) the identity of the observer from the list of qualified individuals maintained by the RA and certification that the observer has no current or prior financial relationship with the applicant or entity seeking BRD certification.

An applicant requesting a certification phase LOA to test an unapproved hard or soft TED as a BRD must first apply for and obtain from the RA an experimental TED authorization pursuant to requirements of 50 CFR part 223.207(e). The application for the certification phase LOA also must append a copy of that authorization.

### A.1 Special Circumstances Not Covered by Protocol

Because actual testing conditions may vary, it may be necessary to deviate from the prescribed protocol to determine if a BRD candidate meets the bycatch reduction criterion. Any foreseeable deviations from the protocol must be described and justified in the application, and if scientifically acceptable will be approved by the RA in the LOA. The RA may consult with evaluation personnel to determine whether the

deviations are scientifically acceptable. Without the RA's approval in the LOA, results from any tests deviating from the protocol may be rejected as scientifically unacceptable, and could result in a denial of certification.

#### B. Observer Requirement

A qualified observer must be on board the vessel during all certification testing operations (See Appendix I). A list of qualified observers is available from the RA. Observers may include employees or individuals acting on behalf of NMFS, state fishery management agencies, universities, or private industry who meet the minimum requirements outlined in Appendix I, but the individual chosen may not have a current or prior financial relationship with the entity seeking BRD certification. It is the responsibility of the applicant to ensure that a qualified observer is on board the vessel during the certification tests. Compensation to the observer, if necessary, must be paid by the applicant. Any change in information or testing circumstances, such as replacement of the observer, must be reported to the RA within 30 days. Under 50 CFR 600.746, the owner and operator of any fishing vessel required to carry an observer as part of a mandatory observer program under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801, *et seq.*) is required to comply with guidelines, regulations, and conditions to ensure their vessel is adequate and safe to carry an observer, and to allow normal observer functions to collect scientific information as described in this protocol. A vessel owner is deemed to meet this requirement if the vessel displays one of the following: (i) A current Commercial Fishing Vessel Safety Examination decal, issued within the last 2 years, that certifies compliance with regulations found in 33 CFR, chapter I, and 46 CFR, chapter I; (ii) a certificate of compliance issued pursuant to 46 CFR 28.710; or (iii) a valid certificate of inspection pursuant to 46 U.S.C. 3311.

#### C. Issuance

The RA will review the application for completeness. If the application is not complete, the RA will notify the applicant of the incompleteness and give the applicant an opportunity to cure. If the incompleteness is not cured within 30 days, the RA will return the application to the applicant. Upon receipt of a complete application, the RA will issue a LOA to conduct certification phase testing of the BRD candidate specified in the application if: (1) The test plan meets the requirements of the protocol; (2) the qualified observer named in the application has no current or prior financial relationship with the entity seeking BRD certification; (3) the BRD candidate design is substantially unlike BRD designs previously determined not to meet the current bycatch reduction criterion, or if the BRD candidate design is substantially similar to a BRD design previously determined not to meet the current bycatch reduction criterion, the application demonstrates that the design could meet the bycatch reduction criterion upon retesting (e.g., the application shows

that statistical results could be improved upon retesting by such things as a larger sample size than that previously used); and (4) the results of any pre-certification phase testing conducted indicate a reasonable scientific basis for further testing. The submission of pre-certification phase data to provide a scientific basis for the conduct of certification testing is not an absolute requirement for the issuance of a certification phase LOA. For example, a request to conduct certification phase testing of a minor modification of a certified BRD design would not need to include pre-certification phase data. Similarly, a request for certification phase testing of a previously failed design that under a different test plan (e.g., larger sample sizes) could yield improved statistical results would likewise not need pre-certification phase data. However, pre-certification phase data would normally be needed to establish a reasonable scientific basis for conducting certification phase testing (e.g., that the BRD could meet the certification criterion upon certification testing). In making these determinations, the RA may consult with evaluation and oversight personnel. If a LOA to conduct certification phase testing is denied, the RA will provide a letter of explanation to the applicant, together with relevant recommendations to address the deficiencies resulting in the denial. Issuance of a LOA allows the applicant to remove or disable the existing certified BRD in one net (to create a control net) and to place the BRD candidate in another net in lieu of a certified BRD (to create an experimental net). All other trawls under tow during the tests must be equipped with a BRD. All trawls under tow during the certification tests must be equipped with an approved TED unless operating under an authorization issued pursuant to 50 CFR 223.207(e). The LOA will specify the date when the applicant may begin to test the BRD candidate, the observer who will conduct the onboard data collection, and the vessel to be used during the test. The LOA and experimental TED authorization, if applicable, must be onboard the vessel while the certification phase tests are being conducted.

#### D. Testing Protocol

Certification testing must be conducted in areas and at times when commercial quantities of penaeid shrimp and finfish pertinent to the certification testing are available to the gear.

Certification testing of BRDs for use in the Gulf EEZ west of 85°30' W. long., must be conducted in areas and at times when juvenile (age 0 and age 1) red snapper are available to the gear. The best time for testing such a BRD candidate is July and August (July 1–August 31) due to the availability of red snapper on the penaeid shrimp commercial grounds located shoreward of the 100-fm (183-m) depth contour west of 85°30' W. long., the approximate longitude of Cape San Blas, FL. A certification test conducted for BRD use west of 85°30' W. long. may also be evaluated for BRD use east of 85°30' W. long. because the requirement that "finfish" were available to the gear would have been satisfied. However, it is preferable that

certification testing for BRD use east of 85°30' W. long. be conducted in that same area.

Data for all certification testing should be recorded on the forms found in Appendices B through G, using the instructions provided for each form.

#### D.1. Tuning the Control and Experimental Trawls Prior to BRD Certification Trials

The primary assumption in assessing the bycatch reduction efficiency of the BRD candidate during paired-net tests is that the inclusion of the BRD candidate in the experimental net is the only factor causing a difference in catch from that of the control net. Therefore, it is imperative that the fishing efficiency of the two nets be as similar as possible prior to starting the certification tests. Catch data from no more than 20 tuning tows should be collected on nets that will be used as control and experimental trawls to determine if there is a between-net or between-side (port vs. starboard) difference in fishing efficiency (bias). Any net/side bias will be reflected as differing catch rates of shrimp and total finfish between two nets that were towed simultaneously. During the tuning tows, these nets should be equipped with identical approved hard TEDs, without the BRD candidate being installed. Using this information, the applicant should identify and minimize the causes for any net/side bias, to the extent practicable, by making appropriate trawl gear adjustments. Form D-1 from Appendix D should be used to record the net/side bias data collected from these tows. These data will enable the RA to determine if any net/side bias existed in either trawl in assessing the BRD candidate's performance.

If the applicant is testing a soft TED as a BRD, it will be imperative that little or no position or side bias with the trawl nets be demonstrated before the certification trials are initiated. Once any net/side bias is corrected using identical approved hard TEDs in both nets, any alterations in catch rate following the substitution of the soft TED into the experimental net can then be attributed to that TED's influence.

#### D.2. Retention of Data Collected During Tuning Trials

All data collected during tuning trials and used for minimizing the net/side bias must be documented and submitted to the RA along with the testing data for evaluation. Additional information on tuning shrimp trawls is available from the Harvesting Technology Branch, Mississippi Laboratories, Pascagoula Facility, 3209 Frederic Street, Pascagoula, Mississippi 39568–1207; phone (601) 762–4591.

#### D.3. Certification Tests

The certification tests must follow the testing protocol where paired identical trawls are towed by a trawler in acceptable testing areas (see introductory paragraph of section D). For tests of BRD candidates that do not encompass testing a hard or soft TED as the BRD candidate, identical approved hard TEDs are required in each trawl and one of the trawls must be equipped with a functioning BRD candidate. To test a hard or soft TED as a BRD candidate, the control net

must be equipped with an approved hard TED, and the experimental net must be equipped with the TED that is acting as the BRD candidate.

A minimum sample size of 30 successful tows per test is required. Additional tows may be necessary for sufficient statistical evidence, especially if catch of the species upon which the bycatch reduction criterion is based (*e.g.*, red snapper) is highly variable. A gear change (*i.e.*, changing nets, doors, or rigging) during a test constitutes the beginning of a new test. All certification tows must be no less than 2 hours and no more than 8 hours in duration. The applicant may select any tow time within this range. Once a tow time is selected, no tow time during a series of tests may vary by more than 10 percent.

To avoid potential biases associated with trynet catches, the outside trawls on quad-rigged vessels must be used as the control and experimental trawls, and for double-rigged vessels, the use of a trynet is prohibited.

The functioning BRD candidate must be switched every 4–6 tows (approximately every 2 days) between the two trawl nets. This process must be repeated, ensuring that an equal number of successful tows are made with the BRD candidate employed in both the port and starboard nets, until a minimum of 30 successful tows have been completed. For BRDs incorporated in the codend of the net, this process can be facilitated by the use of zippers, or other quick-connection devices, to more easily move the codends between nets; however, simply switching the entire net will not satisfy this requirement because doing so would not resolve net bias. Such quick-connection devices must be attached behind the TED. The TED must not be moved unless the BRD is actually incorporated into the TED portion of the net. Where a hard TED is being tested as a BRD candidate, that portion of the net including the TEDs must be moved, and again, quick-connection devices located in front of the TEDs may be used.

A different procedure must be followed to conduct tests of an approved or experimental soft TED as a BRD candidate. To conduct these tests, the applicant must first demonstrate that little or no side/net bias exists between the two nets to be used in the test (see D.1.). Removing the soft TED from one trawl net and installing it in the other net is not required. For these tests, the control (with a hard TED) and experimental (with the soft TED) nets must be disconnected from the doors and their positions switched from one side of the vessel to the other. The first switch must be made after successfully completing approximately 25 percent of the total number of intended tows. This process must be repeated, at 25 percent intervals, until at least 30 successful tows are completed (*i.e.*, every 7–8 successful tows).

Following each paired tow, the catches from the control and experimental nets must be examined separately. This requires that the catch from each net be kept separate from each other, as well as from the catch taken in other nets fished during that tow. First, the observer must weigh the total catch of each test net (control and experimental nets). If the

catch in a net does not fill one standard 1-bushel (ca. 10 gallon) (30 liters) polyethylene shrimp basket (ca. 70 pounds) (31.8 kg), but the tow is otherwise considered successful, data must be collected on the entire catch of that net, and recorded as a “select” sample (see Appendix E). If the catch in a net exceeds 70 pounds (31.8 kg), a well-mixed sample consisting of one standard 1-bushel (ca. 10 gallon) (30 liters) polyethylene shrimp basket must be taken from the total catch of that net.

Data must be collected on Form E-1 for the following species or general groups found in each of the samples: (1) Penaeid shrimp—brown, white and pink shrimp from each sample must be separated by species, counted and weighed; in addition, the weight for those penaeid shrimp species caught in each test net, but that were not included in the sample, must be recorded so that a total shrimp catch for each net (by weight) is documented; (2) crustacea—mantis shrimp, sugar shrimp, seabobs, crabs, lobsters and other similar species—must be weighed as an aggregate; (3) other invertebrates—squid, jellyfish, starfish, sea pansies, shells, and other similar species—must be weighed as an aggregate; (4) each finfish species or species group listed in Appendix E must be weighed and counted; (5) other finfish—including all other fish not listed on the above-referenced form must be weighed as an aggregate; and (6) debris (mud, rocks, and related matter) must be weighed as an aggregate.

“Select” finfish species (page E-3 of this Manual) (*i.e.*, particular species to be quantified from the total catch and not just the sample) are red snapper, Spanish mackerel, and king mackerel. All individuals of the “Select” species from each test net (control and experimental net) must be collected, counted, weighed, and recorded. Lengths for as many as 30 individuals of each select species must be recorded on Form F-1. These data are necessary to robustly determine age-class composition, and specific mortality reductions attributable to each of the age classes.

Applicants must also collect qualitative information, using Form G-1, on the condition (alive or dead) and fate (floated off, swam down, eaten) of the discards whenever possible, and note the presence of any predator species such as sharks, porpoises, and jacks that are observed. The condition and fate of the bycatch is important for determining the fishing mortality and waste associated with this discard.

#### E. Reports

A report on the BRD candidate test results must be submitted for certification. The report must contain a comprehensive description of the tests, copies of all completed data forms used during the certification trials, and photographs, drawings, and similar material describing the BRD. The captain or owner must sign and submit the cover form (Appendix A). The report must include a description and explanation of any unforeseen deviations from the protocol which occurred during the test. Applicants must provide information on the cost of materials, labor, and installation of the BRD candidate. In addition, any

unique or special circumstances of the tests, including special operational characteristics or fishing techniques which enhance the BRD's performance, should be described and documented as appropriate.

#### F. Certification

The RA will determine whether the required reports and supporting materials are sufficient to evaluate the BRD candidate's efficiency. The RA also will determine whether the applicant adhered to the prescribed testing protocol, and whether the BRD candidate meets the bycatch reduction criterion. In making a decision, the RA may consult with evaluation and oversight personnel.

The RA will determine the effectiveness of the BRD candidate. For the western Gulf, the statistical protocol in Appendix H provides the methodology that the RA will use to estimate the reduction in bycatch mortality on age-1 juvenile red snapper if the test is conducted during the primary period (July or August). Tests conducted during other parts of the year will, most likely, catch both age 0 and age 1 red snapper. To evaluate the overall reduction in mortality rate of these juvenile age classes attributable to the BRD candidate will require alternative extensive analysis, involving use of the Goodyear (1995) stock assessment model to assign mortality reductions by specific size classes within the age 0 and age 1 red snapper catch.

For the eastern Gulf the RA will determine the effectiveness of the BRD candidate to, on average, reduce the bycatch of finfish by 30 percent by weight compared to the bycatch of finfish in the designated control net. To evaluate the efficiency of the BRD candidate, the RA will rely on the Southeast Fisheries Science Center to provide statistically valid mean reduction rates in finfish bycatch attributable to the BRD candidate.

Following a favorable determination of these criteria, the RA will certify the BRD (with any appropriate conditions as indicated by test results) and publish the certification in the *Federal Register*.

#### IV. BRDs Not Certified and Resubmission Procedures

The RA will advise the applicant, in writing, if a BRD is not certified. This notification will explain why the BRD was not certified and what the applicant may do to either modify the BRD or the testing procedures to improve the chances of having the BRD certified in the future. If certification was denied because of insufficient information, the RA will explain what information is lacking. The applicant must provide the additional information within 60 days from receipt of such notification; thereafter, the applicant must re-apply. If the RA subsequently certifies the BRD, the RA will announce the certification in the *Federal Register*.

#### V. Decertification of BRDs

The RA will decertify a BRD whenever it is determined that it no longer satisfies the bycatch reduction criterion. Before determining whether to decertify a BRD, the Council and public will be advised and provided an opportunity to comment on the advisability of any proposed decertification.

The RA will consider any comments from the Council and public, and if the RA elects to proceed with decertification of the BRD, the RA will publish proposed and final rules in the **Federal Register** with a comment period of not less than 15 days on the proposed rule.

#### VI. Interactions With Sea Turtles

The following section is provided for informational purposes. Sea turtles are listed under the Endangered Species Act as either endangered or threatened. The following procedures apply to incidental take of sea turtles under 50 CFR 223.206(d)(1):

Any sea turtles taken incidentally during the course of fishing or scientific research activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to the following procedures:

(A) Sea turtles that are actively moving or determined to be dead (as described in paragraph (B)(4) below) must be released over the stern of the boat. In addition, they must be released only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels.

(B) Resuscitation must be attempted on sea turtles that are comatose or inactive by:

(1) Placing the turtle on its bottom shell (plastron) so that the turtle is right side up and elevating its hindquarters at least 6 inches (15.2 cm) for a period of 4 to 24 hours. The amount of elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (7.6 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.

(2) Sea turtles being resuscitated must be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water-soaked towel placed over the head, carapace, and flippers is the most effective method in keeping a turtle moist.

(3) Sea turtles that revive and become active must be released over the stern of the boat only when fishing or scientific collection gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or

injured by vessels. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) must be returned to the water in the same manner as that for actively moving turtles.

(4) A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh has begun to rot; otherwise, the turtle is determined to be comatose or inactive and resuscitation attempts are necessary.

Any sea turtle so taken must not be consumed, sold, landed, offloaded, transshipped, or kept below deck.

#### References

- Gulf of Mexico Fishery Management Council, 1997. Amendment 9 to the Fishery Amendment 9 to the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, Including a Final Supplemental Environmental Impact Statement and Regulatory Impact Review and Social Impact Assessment. Gulf of Mexico Fishery Management Council, 3018 U.S. Highway 301 North, Suite 1000, Tampa, FL 33619, 153 p.
- Goodey, C. P.; 1995. Red snappers in U.S. waters of the Gulf of Mexico. National Marine Fisheries Service, Southeast Fisheries Science Center, Miami Laboratory, Miami, FL. Laboratory Report, Contribution # MIA 95/96-05, 171 p.
- Hoege, H. Dickson and Richard H. Moore; 1977. Fishes of the Gulf of Mexico, Texas, Louisiana, and Adjacent Waters. Texas A&M University Press. College Station, TX, 327 p.
- SAFMC; 1997. Final Bycatch Reduction Device Testing Protocol Manual. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407, 34 p.
- Ward, John M., Teofilo Ozuma and Wade Griffen; 1995 Cost and Revenues in the Gulf of Mexico Shrimp Fishery. NOAA Tech. Mem. NMFS-SEFSC-371, 76 p.

#### Appendix H—Statistical Procedures for Analyzing BRD Evaluation Data Relative to the Western Gulf Criterion

NMFS will calculate the reduction in bycatch mortality (F) based on data gathered during the testing. Both age 0 and age 1 red snapper, ranging in length from 10 mm to 200 mm, occur frequently in shrimp trawls. During the July/August (July 1–August 31) period, the most recently spawned year class

of fish have not fully recruited to the shrimp grounds; thus the catch is represented by a relatively narrow length range of individuals, all of which are considered to be age 1. The numerical reduction in catch-per-unit-effort (CPUE) of this specific age class is expected to be a good predictor of fishing mortality (F) reduction, although the size composition data will be checked for any particular test. The analysis of the data collected under this testing protocol will be based on a modified paired t-test. Because of the varying age and size composition of the red snapper catch taken at other times of the year, more detailed analyses through use of a stock assessment model (Goodey 1995) incorporating the size-specific reduction performance of the device and the seasonal progression of F must be conducted to determine if the BRD candidate will meet the bycatch reduction criterion. Based on the time of the year that the test is conducted, NMFS will utilize the appropriate technique to assess the performance of the BRD candidate as a service for the BRD sponsor.

All experimental tows must be conducted in conformance with the requirements of the BRD testing protocol. Data collected from no more than 20 tuning tows of the control and experimental trawls (without the BRD candidate installed) must be included to determine if any net bias exists prior to beginning certification phase testing. To further reduce problems caused by no or low catches, a tow being considered for certification in the western Gulf must contain a minimum catch of 5 red snapper in at least one trawl for inclusion in the analysis. Once conducted, the tow and the corresponding collected data become the permanent part of the record and cannot be discarded. Only the successful tows will count toward the minimum required; however, information from other tows, if appropriate, will be used in the analysis.

#### Statistical Approach for Calculation of Bycatch Mortality (F) Reduction for Devices Tested in July/August

The statistical approach assumes that the BRD to be tested does not achieve the minimum required reduction rate, ( $R_o$ ). The hypotheses to be tested are as follows:

$H_o$  : BRD does not achieve the minimum required reduction rate,

$$R = \frac{\mu_c - \mu_b}{\mu_c} \leq R_o, \text{ i.e. } (1 - R_o) \mu_c - \mu_b \leq 0.$$

$H_a$  : BRD does achieve the minimum required reduction rate,

$$R = \frac{\mu_c - \mu_b}{\mu_c} > R_o, \text{ i.e. } (1 - R_o) \mu_c - \mu_b > 0.$$

R denotes the actual reduction rate (unknown),  $R_o$  denotes the minimum required reduction rate,  $\mu_c$  denotes the actual

mean CPUE with the control, and  $\mu_b$  denotes the actual mean CPUE with the BRD.

With any hypothesis testing, there are two risks involved known as type I error (rejection of true  $H_o$ ) and type II error

(acceptance of false  $H_0$ ). The probabilities of committing these errors are denoted by alpha and beta, respectively. The probabilities are inversely related to each other. As alpha increases, beta decreases and vice versa. An alpha of 10 percent will be used. The two hypotheses are tested using a 'modified' paired t-test.

The CPUE values for the control and BRD trawls for each successful tow is computed first and is used in the following computations:

$$t = \frac{(1 - R_o) \bar{x} - \bar{y}}{s_{d0} / \sqrt{n}}$$

Where:

$\bar{X}$  is the observed mean CPUE for the control,  $\bar{y}$  is the observed mean CPUE for the BRD,  $s_{d0}$  is the standard deviation of  $d_i = \{(1 - R_o)x_i - y_i\}$

values,  
n is the number of successful tows used in the analysis, and  
 $i = 1, 2, \dots, n$ .

The  $H_0$  will be rejected if  $t > t_{\alpha/2, n-1}$  where  $t_{\alpha/2, n-1}$  denotes the  $(1-\alpha)$  100th percentile score in the t distribution with  $(n-1)$  degrees of freedom.

A  $(1-\alpha)$  100-percent two-sided confidence interval on  $R$  consists of all values of  $R_o$  for which  $H_0: R = R_o$  (versus  $H_a: R \neq R_o$ ) cannot be rejected at the level of significance of alpha. One-sided confidence intervals on  $R$  could also be computed appropriately.

#### Appendix I—Qualifications of Observer

*An observer:*

1. Must have a Bachelor's degree in fisheries biology or closely related field from an accredited college, have at least 6 months experience working with a university, college, state fisheries agency, NMFS, or private research organization such as the Gulf and South Atlantic Fisheries Development Foundation as an observer on a trawler (including research trawlers) in the southeast region, or have successfully completed a training course conducted or approved by the Director of the NMFS Southeast Fisheries Science Center.

2. Must not have a current or prior financial relationship with the entity seeking BRD certification.

*In addition, any individual:*

1. Applying to serve as an observer must provide the names, addresses, and telephone numbers of at least three references who can attest to the applicant's background, experiences, and professional ability. These references will be contacted; unsatisfactory references may be a basis for disapproval of an applicant as an observer.

2. Wishing to serve as an observer should submit a resume and supporting documents to the Director, Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, FL 33149. The Center will use this information to determine which names will be included on a list of qualified observers. If an applicant is not approved as an observer, the RA will notify the applicant of the disapproval and will provide an explanation for the denial.

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