

subsample. The percentage of finfish in the subsample will be used to estimate the total finfish in the catch.

- Target species (weakfish and Spanish mackerel) must be weighed as a species lot, and each individual counted and length measured. For large catches, a subsample of selected individuals for each age-class shall be measured.

- Information must be obtained on other important species (collect total weight and total numbers of individual species in subsample to estimate total weight and total numbers in catch). (Species list: Seatrouts (weakfish, spotted, and silver), Spanish mackerel, king mackerel, cobia, gag, seabasses (black, bank, and rock), spot, croaker, red drum, black drum, pompano, kingfishes (southern and northern), flounders (southern and summer), bluefish, scup, juvenile sharks, sturgeon, shad, and sea turtles (take only measurements that can be taken without harming turtles).)

- A modified paired t-test is the statistical technique to be used for analyzing the data.

- A minimum of 30 successful tows are required to test a new or modified gear.

- A minimum catch (fish per tow) of five weakfish and/or one Spanish mackerel is required to qualify as a successful tow.

- Tow times, time of day, catch rates, and fishing techniques should be comparable to commercial operations.

- Consistent tow times are required in a given series of tows that constitute a test for an individual BRD. A nominal time window (plus or minus 10 percent of tow time) around a specific tow time is allowed.

- Basic operational cost differences should be recorded.

- Shrimp retention must be recorded.

*Statistical Procedures for Analyzing BRD Evaluation Data*

All experimental tows must be conducted strictly under the guidelines specified under the BRD testing protocol. To reduce problems caused by no or low catches, a tow must contain a minimum catch of five weakfish and/or one Spanish mackerel in at least one net for inclusion in the analysis. Once conducted, the tow (and the corresponding data) become the permanent part of the record and cannot be discarded. Only the successful tows (meeting the minimum catch and other requirements) will count toward the minimum required, however all tows will be used in the analysis.

*Statistical Approach*

You should start with the assumption that the BRD to be tested does not achieve the minimum required reduction rate, say  $R_o$ . This assumption will be accepted if the data

provide sufficient evidence to do so. Hence, 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,

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

Here  $R$  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 (rejecting the true  $H_o$ ) and type II error (accepting a false  $H_o$ ). The probabilities of committing these errors are denoted by alpha and beta, respectively, and those are inversely related to each other. As alpha increases, beta decreases, and vice versa. The above test will be conducted with an alpha to be specified by the RA. The above hypotheses should be tested using a "modified" paired t-test.

The CPUE values for the control and BRD nets for each successful tow should be computed first and these will be used in the following computations. The test statistic to be used is given by:

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

Where:

$x$  is the observed mean CPUE for the control,  $y$  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  $H_o$  will be rejected if  $t > -t_{\alpha, n-1}$ , where  $t_{\alpha, n-1}$  denotes the  $(1 - \alpha)$  100<sup>th</sup> percentile score in the t distribution with  $(n - 1)$  degrees of freedom.

The computation of beta (for various assumed reduction rates,  $R_1 < R_o$ ) is somewhat involved and requires the knowledge of unknown parameters (or at least good estimates) of  $\mu_c$  and  $\alpha_{d0}^2$ . Note that  $\alpha_{d0}^2$  is dependent on the  $R_o$  specified (under  $H_o$ ) and equals:

$$(1 - R_o)^2 \alpha_{x_i}^2 + \alpha_{y_i}^2 - 2(1 - R_o)p \cdot \alpha_{x_i} \cdot \alpha_{y_i}$$

where  $p$  is the population correlation coefficient between  $x_i$  and  $y_i$  values.

The computation of beta in advance (in the absence of any preliminary data, i.e., without good parameter estimates) is almost

impossible. More work in this direction is still needed. However, it is clear that beta could be reduced by increasing alpha or  $n$  or both.

A  $(1 - \alpha)$  100-percent two-sided confidence interval on  $R$  consists of all values of  $R_o$  for which

$H_o: R = R_o$  (versus  $H_1: R \neq R_o$ ) cannot be rejected at the level of significance of alpha. One-sided confidence intervals on  $R$  could also be computed appropriately.

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**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Part 679**

[Docket No. 961107312-7021-02; I.D. 041097E]

**Fisheries of the Exclusive Economic Zone Off Alaska; Species in the Rock Sole/Flathead Sole/"Other Flatfish" Fishery Category by Vessels Using Trawl Gear in Bering Sea and Aleutian Islands**

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

**ACTION:** Closure.

**SUMMARY:** NMFS is closing directed fishing for species in the rock sole/flathead sole/"other flatfish" fishery category by

vessels using trawl gear in the Bering Sea and Aleutian Islands management area (BSAI). This action is necessary to prevent exceeding the second seasonal apportionment of the 1997 Pacific halibut bycatch allowance specified for the trawl rock sole/flathead sole/"other flatfish" fishery category.

**EFFECTIVE DATE:** 1200 hrs, Alaska local time (A.l.t.), April 12, 1997, until 1200 hrs, A.l.t., July 1, 1997.

**FOR FURTHER INFORMATION CONTACT:** Mary Furuness, 907-586-7228.

**SUPPLEMENTARY INFORMATION:** The groundfish fishery in the BSAI exclusive economic zone is managed by NMFS according to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area (FMP) prepared by the North Pacific Fishery Management Council under

authority of the Magnuson-Stevens Fishery Conservation and Management Act. Fishing by U.S. vessels is governed by regulations implementing the FMP at subpart H of 50 CFR part 600 and 50 CFR part 679.

The second seasonal apportionment of the 1997 halibut bycatch allowance specified for the BSAI trawl rock sole/flathead sole/"other flatfish" fishery category, which is defined at § 679.21(e)(3)(iv)(B)(2), was established by the Final 1997 Harvest Specifications of Groundfish for the BSAI (62 FR 7168, February 18, 1997) as 130 mt.

In accordance with § 679.21(e)(7)(iv), the Administrator, Alaska Region, NMFS, has determined that the second seasonal apportionment of the 1997 halibut bycatch allowance specified for the trawl rock sole/flathead sole/"other flatfish" fishery in the BSAI has been caught. Consequently, NMFS is closing directed fishing for species in the rock sole/flathead sole/"other flatfish" fishery category by vessels using trawl gear in the BSAI for the remainder of the season.

Maximum retainable bycatch amounts may be found in the regulations at § 679.20(e) and (f).

**Classification**

This action is required by 50 CFR 679.21 and is exempt from review under E.O. 12866.

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

Dated: April 11, 1997.

**Gary Matlock,**

*Director, Office of Sustainable Fisheries,  
National Marine Fisheries Service.*

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