Testing of a Bycatch Reduction Device (BRD) on a Double Rigged Industrial Trawler off the Coast of Trinidad and Tobago

Prueba de un Dispositivo de Reducción de Captura Incidental (BRD) en un Arrastrero Industrial de Doble Calado Frente a la Costa de Trinidad y Tobago

Essai d'un Dispositif de Réduction des Prises Accessoires (BRD) sur un Chalutier Industriel a Double Installation au Large des Côtes de Trinité-Et-Tobago

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EXTENDED ABSTRACT

Introduction

The shrimp trawl fishery of Trinidad and Tobago is considered to be one of the country's most valuable fisheries in terms of economic returns. Most trawl vessels operate in the Gulf of Paria on Trinidad's west coast while some non artisanal trawlers also operate on the south coast. From November 15th to January 15th each year, trawling is permitted during daylight hours (6.00 am – 6.00 pm) in areas West of Saut D'eau Island on the North Coast. No trawling is permitted on the east coast.

The Fisheries Division in 2016 has on record one hundred and three (103) artisanal trawlers using pirogues with manually retrieved gear and thirty eight (38) non artisanal trawl vessels fishing either one or two mechanically retrieved nets. These vessels target 5 species of shrimp but bycatch of marketable size caught by this fleet is considered economically important.

Bycatch from local commercial shrimp trawlers can be as high as fifteen (15) pounds of bycatch to one (1) pound of shrimp with as much as 94% of the catch discarded. A large percentage of discards from the trawl fleet are juveniles of species of commercial or biological importance (Fisheries Division a), 2017). Policy directions for the management of this fishery promote strategies which minimize the amount of bycatch taken and promote the release of juvenile fish caught incidentally in this gear. The Draft Management Plan for the Shrimp Trawl Fishery (Fisheries Division b) (2014) identifies policy directions that promote the introduction of By-Catch Reduction Devices (BRDs) in trawl gear that can reduce discards.

As part of the "Sustainable Management of Bycatch in Latin America and Caribbean Trawl Fisheries" (REBYC – II LAC) project, the Fisheries Division together with fishers/trawl operators conducted experimental gear trials to test a two inch square mesh Bycatch Reduction Device (BRD) on board an industrial double rigged shrimp trawler. The device was proposed by the trawl industry as a viable option to release juvenile fish caught in trawl gear while still allowing fishers to catch fish of marketable size.

There has been a very strong push by conservation minded individuals to ban trawl fisheries in Trinidad and Tobago. In 2013 a ban on industrial trawling was agreed to by the Cabinet of Trinidad and Tobago but pressure from the industry, a lack of suitable alternatives and the potential socio-economic impacts arising from this measure lead to a lifting of this ban. An additional suite of management measures to improve the sustainability of this method was recommended for this fishery and fisheries managers continued to work with the trawl industry to sensitive them on the need for improved fishing practices.

Methodology

In 2016, training was provided to Government Officials and Trawl industry stakeholders in by-catch reduction technologies by the National Oceanographic and Atmospheric Administration (NOAA) of the USA.

A 2 inch square mesh panel (BRD) was considered the most suitable device for the management objectives of this fishery. A trawler owner constructed two BRDs, each 14 meshes long by 6 meshes across. Each BRD was inserted into the upper body of two trawl nets on a double rigged industrial trawler. For each haul, one of the BRDs was covered with webbing material and this net served as the control net while the other was left to fish with the BRD uncovered. In all instance one net served as a control net while the other net was fished with the BRD installed.

A total of 29 hauls (15 daylight and 14 night hauls) were completed over the period July – August 2017. Each of the control and BRD nets were fished simultaneously for four (4) hours during each haul. The nets were switched from port to starboard sides of the vessel after every two hauls to reduce net side variation. The deck of the boat was compartmentalized and catches from each net was maintained separately. Shrimp and marketable fish were sorted and removed from the catch by the crew, while all discards were randomly placed into colour coded baskets. Total weights of shrimp, marketable fin fish and discards were recorded for the control and BRD nets for each haul. A random basket from the BRD and control catches was taken for sorting of individual species by numbers, weights and lengths.

Results

A total of 1577.7lbs of shrimp were caught from the 29 trawls done, with almost equal weights of shrimp being captured from the BRD net and the control net. There was an average of 26.8lbs of shrimp captured by the BRD net versus an average of 27.5lbs of shrimp captured by the control net per trip. A paired T test was done and it was determined that there was no significant loss of shrimp from the use of the BRD at this location in the trawl net.

An average of 25.5lbs and 26.4lbs of usable fin fish were caught in the BRD and control nets respectively. A paired t-test was done and it was determined that there is a significant difference in the weights of usable catch captured in the BRD net and the control net.

The main objective of the BRD is to reduce the amount of fish caught that would normally be discarded. The 29 drags done for this trial captured 12,023 lbs of discards, 64% of which was obtained by the control net. An average of 178 lbs and 236 lbs of discards were caught per trip in the BRD and control nets respectively. Overall there was a 24.5% reduction in discards in the BRD nets as compared to the control net. The Paired T test suggests that there is significant reduction in the catches of fish that would normally be discarded when the control net was compared to the BRD net..

Overall, the results showed no significant loss of shrimp or useable bycatch between the control and BRD nets as well as a 24.5% reduction in discards by weight when the BRD was used at this position in the trawl net.

Recommendations

There are positive economic incentives for trawl operators to use the BRD which bodes well for its eventual adoption and use by the industry. Fishers involved in the trials were quite happy that the time needed to sort catches was less when the BRD was used. The reduction in discards meant less manual labour for crew and more time in between drags for personal time. They also indicated that they understood and accepted that less discards of juveniles of commercial species would result in improved future catches for themselves and for fishers from other fleets. Other benefits from use of the device include reduced enforcement costs, less impacts on biodiversity and a more favorable image for trawl fishers.

The chosen BRD has the potential to work effectively. Gear trials are expected to continue with support from the REBYC – II LAC Project. Modifications in the placement of the BRD, its design and possible use in combination with other devices will be tested to improve efficiency. The continued involvement of the fishers is critical as enforcement costs are high and it is hoped that the benefits of using the device will result in the industry adopting and voluntarily using the device.

KEYWORDS: Bycatch reduction device, BRD, gear trials, bycatch