



WESTERN CENTRAL ATLANTIC FISHERY COMMISSION (WECAFC)

Regional Strategy on the management of bycatch and discards in Latin American and Caribbean [WECAFC] bottom trawl [shrimp and groundfish] fisheries

1. Introduction

a. Background

In 2013-2015, during the development of the project on Sustainable Management of Bycatch in Latin American and Caribbean Shrimp Fisheries, (REBYC-II LAC), participating countries noted the lack of a regional mechanism or strategy that guides the management of bycatch in bottom trawl fisheries. They noted reports of the WECAFC Working Group on Shrimp¹ and groundfish that improved practices in bottom trawling required increased coordination and communication as well as a common approach.

As such, they requested FAO, through WECAFC, to lead the development of a strategy on bycatch management in trawl fisheries that ensured a common approach across borders. They called upon the strategy to be short and concise, respecting the fact that these fisheries take place in the continental shelf, but stressing that by following a common approach and using the same language and action steps, partners and countries can strengthen regional collaboration and improve information and technology transfer. REBYC-II LAC partners also considered that the development of this common strategy was a mechanism to involve countries in the region that were unfortunately not participating directly in the project. This is also a key recommendation of the International Guidelines on Bycatch Management and Reduction of Discards.

As such, the REBYC-II LAC project was given the mandate to develop a Regional Strategy on Bycatch Management in Tropical Shrimp/Bottom Trawl Fisheries for Latin America and the Caribbean. The elements and items of this strategy were drafted during expert workshops and consultations held under the auspices of the REBYC-II LAC project.

b. Definition of bycatch

¹ This Working Group is still in existence, albeit with the name, "WECAFC/CRFM/IFREMER Working Group on Shrimp and Groundfish in the Northern Brazil-Guianas Shelf."

Paragraph 2.4.1 of the International Guidelines on Management of Bycatch do not provide an agreed definition of bycatch *“because of the very diverse nature of the world’s fisheries, historical differences in how bycatch has been defined nationally, ambiguities associated with bycatch related terminologies and choices of individual fishers on how different portions of their catch will be used. Also, there are functional interpretations of bycatch that include catch that a fisher did not intend to catch but could not avoid, often did not want or chose not to use. There are also regulatory interpretations of bycatch in fisheries management plans and these types of interpretations may not necessarily coincide.”*

While a worldwide common definition of bycatch does not exist, for the purposes of this strategy the following definitions are considered.

Target Catch -- The catch of a species or species assemblage that is primarily sought in a fishery.

Bycatch- Retained catch of non-targeted species as well as discards returned to sea. Catch of non-targeted species², either retained or returned to sea dead or alive.

Discards- The portion of the catch returned to sea because of economic, legal or personal considerations.

Countries themselves must determine more specific definitions in the context of their national fisheries management regulations and practices.

c. Why a regional strategy?

Regional collaboration in bycatch management is necessary, considering the transboundary nature of the marine environment and resources. This is especially true with respect to bottom/shrimp trawl fisheries where many of the bycatch issues and concerns are shared across the region. Well-tested and effective solutions benefit all countries in the region, particularly considering the increasingly strict import requirements established by the large seafood markets of North America and the European Union. Regional organizations such as CRFM, OSPESCA and WECAFC must lead the effort to implement this strategy and strengthen and promote experience sharing and mobilization of political support. A common strategy improves regional cooperation.

In this context, WECAFC, CRFM and OSPESCA have all passed resolutions calling for the implementation of the International Guidelines on the Management of Bycatch and Discards.

A regional strategy on the management of bycatch in bottom/shrimp trawl fisheries establishes a framework for the support and collaboration required to improve the sustainability of these fisheries.

2. Vision

Reduce bycatch and discards in the shrimp/fish bottom trawl fisheries of Latin America and the Caribbean to the maximum extent practicable by implementing the International Guidelines on

² Bycatch can be fish and/or marine mammals, sea turtles, and seabirds that become hooked or entangled in fishing gear.

Bycatch Management and Reduction of Discards and working in collaboration with fishers and other stakeholders through an Ecosystem Approach to Fisheries.

3. Strategy Objectives

- a. **Apply an Ecosystem Approach to Fisheries for the management of bycatch and discards** using management best practices, where all species caught in a defined unit are considered for management and where management plans and regulations include measures to minimize bycatch and discards.
- b. **Improve data collection and monitoring procedures** and update national and regional fishery statistics databases. This includes regular catch composition surveys, monitoring landings and logbook reports and using on-board observers. It also includes data collection on socio-economic variables that are drivers of bycatch and discards such as fisher/boat income, ex-vessel prices, cost distribution and market availability.
- c. **Reduce bycatch with the effective use of Turtle Excluding Devices (TED) and Bycatch Reduction Devices (BRD)** and develop improved BRD devices through standard methodologies that include participatory research and technology transfer.
- d. Minimize the impacts of unavoidable bycatch through careful handling and release practices and procedures.
- e. **Mainstream the use of spatial and temporal measures** to reduce bycatch, protect endangered and threatened species, protect vulnerable life history stages and minimize impacts on vulnerable habitats.
- f. **Reduce bycatch** by promoting investment and government support for TEDS and BRDs and promote viable value chains for sustainable target catch levels. This includes the potential for utilizing bycatch, with the exception of endangered, threatened or protected species (ETP), in its school and community feeding programs.
- g. **Strengthened communication, coordination and information sharing** through regional partners to disseminate best practices in bycatch management. WECAFC/CRFM and other regional partners can help provide the best technical support available and monitor the implementation of the strategy.

4. Strategic Actions

A. Managing Bycatch and discards through an Ecosystem Approach to Fisheries.

1. The management of bycatch and discards in Latin American and Caribbean bottom trawl fisheries follows an Ecosystem Approach to Fisheries that considers ecological and human well-being as well as an enabling governance framework.
2. Fisheries management frameworks, including management plans and legislation include regulations and or rules for the management of the fishery to minimize bycatch and discards.

3. Fisheries management plans consider ecosystem and stock boundaries rather than political boundaries and consider all other users of the same resource and marine space.
4. Fisheries management plans take into consideration the context of livelihoods and prevention of damage to public resources.
5. Fisheries management plans that consider bycatch and discards must consider impacted species including other fishery or non-fishery species including birds, mammals, turtles and habitats (deep-water reefs, benthic invertebrates).

B. Data Collection, Monitoring and Evaluation

Management of bycatch and discards in bottom trawl fisheries requires accurate and timely data collection and strong monitoring systems at the national level to understand the impact of bycatch on biodiversity, livelihoods and associated fisheries.

Actions

- Strengthen data collection protocols in the region utilizing available data collection methods such as log-books and landings data. Update data collection protocols to standardize bycatch reporting methodologies across the region. Strengthen data access and sharing policies consistent with broader efforts undertaken by WECAFC.
- Where possible, implement regular on-board data collection methods, including the use of observers³, to validate logbook data and more accurately assess bycatch and discards. When not possible use methods such as last haul landed rule, cameras, and other approaches.
- Include bycatch and catch composition data into existing national fisheries data collection and statistics systems and/or databases. Cross-reference catch and habitat data to relate catches to habitat types.
- Understand the socio-economic impacts of bycatch and discards and prepare to evaluate the impacts of different management scenarios on these variables. This includes short and long-term estimates of impacts on food security and livelihoods.

The following table shows possible data parameters to enhance data collection, monitoring and evaluation of bycatch and discards.

Parameter	Variables
Biological: Catch and Discard Variables	

³ Fishery observers and at-sea monitors collect data from commercial fishing and processing vessels as well as from shoreside processing plants and receiving vessels known as “motherships.” Observers are professionally trained biological technicians gathering first-hand data on what is caught and discarded. They also track interactions with marine mammals, sea turtles, and seabirds.

Target species/species group	species (or species group)
Total Catch	weight; number, number of baskets/bins/boxes; holds (volume)
Target Species Composition	sampled species; number of baskets/bins/boxes/holds by species
Average sizes	sampled fish species, length, weight, catch weight by size grades
Bycatch composition	sampled species, length, weight, catch weight by size grades/ spp identification /retained species biomass
Discards	Species composition; weight; number of baskets/bins/boxes; whole/macerated
Ratios	Bycatch to target catch ratio, discard to catch ratio
CPUE	Catch per tow. Bycatch/ tow
Tow duration/bottom time	Tow start date/time – Tow end date/time
Tow depth	Tow start depth/end depth – Tow average depth
ETP/TEP composition/morphology	Threatened, endangered or protected species, size/length/weight/composition/ # spp.
Habitat	Quality/ area/ degradation index / add a bit of information/bottom type (sandy/mud/hard/mixed/unknown)
Abundance	CPUE/ Stock assessment/ stock size, catch rate/ mean size/ recruitment
Economic: Production and earnings variables	
Product type	whole round/green; gutted; boned; headed; fins off; fillet; skin on/off; loin; mince; surimi; fish meal (from whole fish/discards/broken or sour/ offal etc.); consumer packs
Product storage	whole frozen; IQF; hold frozen; storage temperatures; dry; brine; salted; fresh
Product packaging	individually marked and packed (e.g. tunas); carton (type and weight); bag (type and weight); basket (type and weight); barrel
Processing equipment	machine type; production rate, availability
Total Revenue from fishing	Revenue per tow/ annual seasonal revenue/ per trip
Net profit from fishing	Revenue minus costs
Value of landings	Harvest/catch values by species or group. Value of catch/ trawl type/ gear type
Revenue, profit, value of landed bycatch	Contribution of landed bycatch to Total revenue, net profit and overall value of landings
Price of products (value added)	market/export price, ex vessel price (for both target and non-target species)
Cost of bycatch and discards	Loss of future opportunity; cost of habitat damage; income loss/gain across sub-sectors
Fishing Gear/Effort Variables	
Gear	Gear type
Construction	mesh, material, doors, TED, grids, escape doors, diversions etc.
TED/BRD	Material, type, location, size
Trawl Size	Length, depth, headline, foot rope, lazy rope, tickler

	chain,
Deployment	bottom/mid-water
Subsidiary vessels	dinghies, scout, net boat
Electronics	beacons, sounder, mass sensors, GPS, depth finder, AIS
Markings	gear number, vessel identification
Trawl	date, time, speed, positions for "gear set, "on bottom" "at school" closed, off bottom, haul start, on surface, trawl track
Socio-Economic Variables	
Number of persons employed in fishery	Employees by primary, secondary and tertiary sectors, disaggregated by age sex and job category. Time spent in occupation
Unemployment/employment	Unemployment in region/community/nation or #/% of locals in fishery
Earnings	earnings for each crew member/ earnings for each fishing household
Food security	quantity of landings for food/nonfood uses (catch and bycatch); bycatch contribution to local diets; nutrient gains/losses
Earning distribution	Wages as % of cost/ wages in relation to minimum national wage/ revenue distribution on vessel
Poverty	Poverty levels in fishery/community
Livelihoods	Income/earnings from fishing or associated activities
Gender	Disaggregated gender data/role of women/ power distribution/ % of workers that are female, young, male.
Governance Variables	
Normative laws	Number/existence of regulations/laws/ policy/management plans
Policies and objectives	Presence of long term and prioritized policies
Compliance	Fisheries patrols, arrests, sanctions, enforcement/
Transparency	Available information on decision-making/ participation
Management capacity	Management plans/ management staff, fisher knowledge of plans
Management response	Management measures- spatial, temporal closures. Gear regulations, effort regulations, input regulation
Participation	Committees/ Council, participation of fishers/community members in fisheries meetings
Organization strength	Number of organizations, # of member in organizations, # of meetings, perceived influence on decision making
Capacity	Capacity of staff in institutions/fishery organizations, # of trainings, improved knowledge transfer
Data availability and capture	General data availability, fishery information system, ease of access, use in fishery

C. Bycatch Reduction

Measures to reduce bycatch in tropical bottom trawl fisheries focus on improvements in fishing technology and strengthened management measures. Fishing gear changes include the introduction of Turtle Excluder Devices (TED) and Bycatch Reduction Devices (BRD) on existing nets. They may also include changes to the shape, size or mesh size of bottom trawl nets. Spatial and temporal measures may also protect critical areas, life-stages and habitats as well as vulnerable, endangered and protected species. Across the region, management plans and frameworks will include mandates to implement bycatch reduction practices in all bottom/shrimp trawl fisheries. Use best available science to deploy targeted regulations and measures that improve management of bycatch and discards.

Actions

1. Incorporate fishing sector and other stakeholders for the entire continuum of decision-making activities to manage bycatch. This includes the participation of fishers, researchers, government, NGOs and others from the start of planning or inception activities through field trials, result dissemination, and implementation of the chosen practices or management measures.
2. Improve understanding of the impacts and trade-offs of bycatch management measures by evaluating:
 - a. Social and economic impact of bycatch;
 - b. Ecological baseline of the fishery;
 - c. Operational costs for fishery.
3. Establish specific national objectives and targets for bycatch reduction purposes. This includes:
 - a. Type and quantity of bycatch reduction measures;
 - b. Type and quantity of non-ETP bycatch that can be landed;
 - c. Reduce bycatch of Endangered, Threatened and Protected species;
 - d. Reduce impacts on vulnerable life history stages of target and bycatch species.
4. Evaluate bycatch reduction measures against baseline data and establish a bycatch information system or include bycatch data in current fishery monitoring programmes.

Minimum baseline data will include:

- a. Catch composition baselines across years and seasons
- b. Identification of vulnerable, endangered or critical species
- c. Location of fishing areas
- d. Basic information on the fishery

5. Share research results amongst countries, either bilaterally or through regional fishery bodies or regional organizations. This may decrease the cost to a single country of the testing of new fishing gear.
6. Jointly generate a research and development protocol for additional information needed on the use of TEDs and BRDs with fishery stakeholders that follows a scientifically rigorous methodology.
7. Incorporate research and information on TEDs and BRDs that is already available.
 - a. Allow fishers to manipulate, test or develop devices independently, based on the criteria established in the normative framework.
 - b. Fisher innovations must still be field tested under the scientifically rigorous methodology mentioned above.
8. Identify areas or times of high bycatch or bycatch of critical species, spawning individuals or ETP species and introduce spatial and temporal measures to reduce high volumes of bycatch or critical/vulnerable species.
9. WECAFC Members promote the communication of the processes and results of their bycatch reduction activities. An information sharing system under WECAFC management could serve as a conduit to share the results of bycatch management measures or reduction trials. This system includes the REBYC-II LAC Project web site, as well as an open Access forum that facilitates regional discussions.
10. All WECAFC partners must emphasize results sharing and capacity-building activities to improve the private sector's fishing practices. This might include:
 - a. Field visits or monitoring to evaluate bycatch reduction activities
 - b. Joint training for fishers, researchers and other involved stakeholders
 - c. Follow-up by trained international experts on fishing technology.

Recommendations

- All WECAFC countries should establish country-specific guidelines to incorporate, regulate and enforce bycatch reduction technologies, including turtle excluder devices and bycatch reduction devices and as necessary, develop and test new BRDs.
- Request assistance from FAO, the United States, EU and other international partners to provide technical training and build capacity to introduce and apply bycatch reduction technologies in (bottom trawl) fisheries.
- Through a participatory and transparent process, countries should update rules and regulations to mandate the use of bycatch reduction technologies and best practices.

D. Sustainable Bycatch Utilization (non-ETP Species)

Even with improved fishing gear and effective spatial or temporal closures, bottom trawl nets will continue to capture bycatch. Utilizing discards and improving the value of previously retained bycatch may compensate for the losses generated by bycatch reduction measures and compensate for any potential impacts on food security and livelihoods. When executed correctly, it also provides an incentive for the fishing sector to reduce bycatch and improve compliance.

To improve utilization of non-ETP species, the following considerations should be taken into account:

- Improved utilization of bycatch must focus only on species or fisheries that may be landed within sustainable levels.
 - Use stock assessments or other methodologies such as life-history of bycatch species or potential impact and monitoring of fishery on stocks to define sustainable bycatch.
- Consider the possible effects of targeting bycatch species and its potential to drive overfishing or other impacts on the ecosystem.
- Improve bycatch utilization only when bycatch and discards have been reduced to the greatest extent practicable.
- Understand the economic, social and environmental feasibility of utilizing bycatch.

a. Strategic components for bycatch utilization of non-ETP species

1. Define bycatch composition
 - Most WECAFC members have a basic understanding of catch composition and of the species with utilization potential. A first step is to update or complete this information and integrate spatial, temporal and fleet distribution considerations into the data. Fleet distribution considerations include, for example, expansion of trawling into deeper waters and new resources.
 - Define what non-ETP species or families can be processed together. This may increase supply for a production process (surimi or silage, for example).
2. Define viable non-ETP species bycatch utilization systems/technologies
 - A variety of utilization systems/technologies are available. Utilization initiatives must define the most viable available processing system.
 - Train value chain participants on appropriate fish handling safety and protocols, particularly sanitary measures.
3. Establish a pathway for change

- Government participation is crucial, particularly through public policy and by incorporating bycatch utilization into existing strategic programmes. These changes may be generated through:
 - A public purchasing programme that secures bycatch products for various purposes.
 - Government credits and other low-cost loans to finance non-ETP species bycatch utilization processes.
 - Modify legal and policy frameworks to improve the enabling environment for bycatch utilization (ex. review prohibitions on transshipments) and that engage the sector.
 - Connect various ministries and institutions responsible for promoting healthy diets, consumption, technologies, entrepreneurship, etc.
 - Explore the viability of utilizing non-ETP species bycatch in school or community feeding programs, non-food products. This could provide fishers with a fixed source of demand and protect from significant price drops or market fluctuations.

- In the private sector, consistent and good revenues are a driver of change. Collaborate with the private sector to improve auto-enforcement of regulations and investments in food security. Jointly develop pilot utilization projects (in coordination with government and others). Involve the academic and food technology sector to provide guidance and expertise.

- Facilitate international coordination to collaborate on utilization practices and technologies and open potential markets for non-ETP species bycatch-derived products.

- 4. Identify critical institutional changes and pathways

- Critical institutions for success include Agriculture Ministries, Fisheries Ministries/Departments, Natural Resource/Environmental Ministries, Social Development Ministries and Education Ministries. Research and technological institutions are also common throughout the region and are critical to the success of new food processing initiatives.

- 5. Identify crucial actors to promote change

- The private sector is the crucial actor of improved utilization. It must have proactive participation in utilization initiatives, in collaboration with government. Core representatives from fisher organizations and associations are responsible not only for communicating with government, but also relaying information and generating change within their member constituencies.

- 6. Establish Milestones for Change

- Establish milestones for change regarding utilization. While the REBYC-II LAC hopes to reduce discards by 20%, regional partners must define how much of this reduction shall be due to decreases in bycatch and how much due to improved utilization.

E. Strengthened communication, coordination and information sharing

- Increase trust between government and stakeholders. This includes regular meetings, communication notes and presentations in language that is easy to understand. Produce photographs and video of ongoing research (catch composition surveys, BRD tests, and underwater surveys) to enhance understanding of bycatch management measures.
- Ensure and promote use and access to data related to bycatch, including those collected under item B of the strategy.
- Develop science networks and forums on bycatch in trawling. This includes the CRFM/WECAFC/IFREMER Working Group on Shrimp and Groundfish of the North Brazil-Shelf, the WECAFC-FIRMS data management partnership and the WECAFC/OSPESCA/CRFM tri-partite coordination committee.
- Engage communities in the bycatch management measures, understand their concerns and traditional knowledge and incorporate them into any decision-making process.
- When possible, enhance collaboration and communication between fishers and gear/fishing technologists to provide advice and review fishing practices and improve compliance.
- Where possible, enhance collaboration between fishers from different regions by arranging joint workshops or port visits to exchange ideas and share best practices.

F. Strategy Implementation

- Develop a National Strategy to reduce bycatch in shrimp/bottom trawl fisheries.
- Support the development of regional or global projects, similar to REBYC and REBYC-II LAC to facilitate technology and knowledge transfer.
- Engage regional partners such as CRFM, WECAFC and OSPESCA to support regional knowledge exchange and national action plans to manage bycatch and discards. Invite WECAFC members such as the United States, European Union, and others that have experience and success managing bycatch in bottom trawl fisheries.
- Strengthen the CRFM/WECAFC/IFREMER Working Group on Shrimp and Groundfish of the North Brazil-Shelf and other regional bodies that can provide guidance and support to the implementation of the Strategy.