



Caribbean billfish best use: food security time bomb, or untapped opportunity for sustainable foreign investment and tourism?

A 2009 global assessment determined the Western Central Atlantic Ocean, which includes the Caribbean region, to be the most overfished region worldwide (FAO, 2011). This region's overall harvests also fell from the 30 year average of 1.7 million tonnes, to an average of 1.4 million tonnes over the last 10 years (Hoydal, 2016). This regional harvest reduction resulted from overfishing effects, climate change impacts and adjustments of the regions fishing activities to suit current conditions and seafood markets. Caribbean nations continue to develop their fisheries targeting large fish that live in open water, also known as pelagic fishes. These efforts typically seek to replace harvest reductions from already overfished near shore fish stocks. However, the importance of already overfished billfish species stocks in supporting these fisheries is a regional concern threatening the future livelihoods and food security for millions of Caribbean citizens. The developing fisheries harvesting large pelagic fishes using long lines, purse seine nets and Fish Aggregating Devices (FADs) also capture many other species that are already unsustainably overfished and experiencing continued overfishing impacts. Billfish stocks simply cannot sustain ongoing fishery developments in the long term. More effective fishery management is urgently required on national, regional and ocean-wide scales to ensure sustainability and let these valuable stocks recover.



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KEY FACTS

What are billfish?

Billfish species caught in the Caribbean include blue marlin, white marlin, sailfish, roundscale spearfish and longbill spearfish. They are large apex marine predators, characterized by a long extension of their upper jaw, termed their "bill". Many pelagic fisheries capture billfish and their per-fish financial value to recreational fisheries far exceeds that of their commercial sales value for consumption.

Critical losses and concerns

All assessed Atlantic billfish species have experienced overfishing for over a decade, and their stocks have declined by the percentages below as a result:

- Blue Marlin – 70%
- White Marlin – 90.3%
- Sailfish – 95.8%

Overfishing threatens food security and continues to reduce the financial potential of all fisheries capturing billfish. FADs are being deployed to improve harvests without acknowledging the risks of doing this without effective and sustainable fisheries management already being in place. Some best practice documents have been produced by the Caribbean Regional Fisheries Mechanism (CRFM), but have not yet been widely implemented in the region.

FAO's work in CARICOM

The Caribbean Billfish Project has developed a Caribbean Billfish Management and Conservation Plan to address issues, while also testing innovative fisheries management and seafood market adjustments to ensure the sustainable capture of maximum value and food security from billfish and tunas.

Who manages billfishes in the Caribbean and how?

Billfish are highly migratory fishes, and harvests from their stocks are therefore shared among many nations both within and beyond areas of national jurisdiction. This complicates billfish stock management and requires international commissions to set quotas and rules on regional and/or ocean-wide scales. The International Commission for the Conservation of Atlantic Tunas (ICCAT) is the international Regional Fisheries Management Organization (RFMO) responsible for the Atlantic-wide sustainable management of tunas and billfishes. The ICCAT conducts stock assessments and continues to make increasingly stern recommendations and quota allocations to support its increasingly urgent marlin stock rebuilding plan. Recommended measures have also been made for sailfish in recent years. The ICCAT also notes increasing concern for the rapid and typically ad hoc developments of small-scale and artisanal fisheries targeting billfish, with some Caribbean states specifically mentioned in its latest independent performance review (Spencer *et al.* 2016). Poor responsiveness to data and/or membership requests were also highlighted as requiring urgent resolution.



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The ICCAT considers billfishes as by-catch species for commercial fisheries that primarily target high value tunas. Comparing billfish harvest proportions of other ICCAT member fleets to Caribbean fleets fishing the same stocks, or visiting Caribbean fish markets, makes it clear that billfish are not typically considered bycatch by Caribbean fisheries. Coupling large regional demand for billfish meat with ever-growing and inter-connected Caribbean markets, the incentive to target billfish for harvest in the region is very clear. Unfortunately, so too is the fact that these developing Caribbean fishery actions stand in direct contrast to the sustainable billfish stock management recommendations and advice from ICCAT, which seeks to actively reduce billfish mortality rates to within sustainable limits.

Billfish at the intersection between food security, commercial industry and eco-tourism?

Billfish harvests do provide important food security and livelihoods to artisanal and small-scale commercial fishers. Billfish are also frequently caught by larger commercial fisheries, and are either released if genuinely considered bycatch (72 percent alive by USA fleet), or retained and sold. Profit seeking commercial sales can therefore directly impact artisanal fishers' food security and livelihood support potential. To a recreational fisher in the Caribbean a single billfish is worth USD 761, or USD 1 494 if trophy-sized. The per fish value also multiplies each time a recreational fisher successfully releases a billfish that is later recaptured. Average trip expenditures by recreational fishers in the Caribbean are USD 14 164 and USD 2 442 for non-resident and residents, respectively (Gentner, 2018). Recreational fishing fleets can also support the employment of local fishers and other citizens within their supporting high value tourism industry.



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Fish Aggregating Devices (FADs): the good the bad and the technical

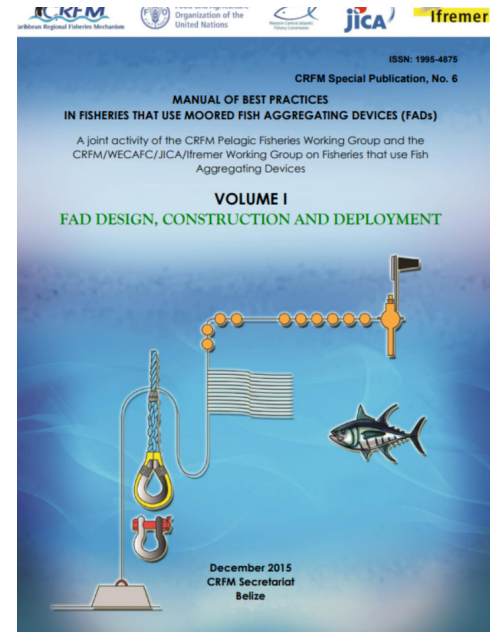
Many Caribbean nations actively promote the deployment of moored FADs, primarily to improve small-scale fishers' access to harvest pelagic species, but few nations are following sustainable guidelines. These FAD deployments provide short-term benefits to small-scale fishers, but FADs introduce their own fisheries sustainability issues. Of course, short-term financial developments seen in coastal communities through FAD deployments are considered positive to these citizens' livelihoods, but the risks explained below are associated with these developments in the longer term.

The FADs only congregate pelagic fishes to allow more targeted fishing for them, they do not actually increase fish stocks overall abundance or productivity. They only make the remaining fish much easier to catch, and therefore at greater risk of being unsustainably harvested. FADs do conveniently help fishing communities improve their catch rates of pelagic fishes, but they also make the same fishers compete directly with larger commercial fleets that have already severely overfished billfish species for many decades. The FAD increased harvests by small-scale fishers must therefore be balanced by reduced harvests in larger commercial fleets if overall stock sustainability is to be achieved and maintained. This is the key challenge that is urgently requiring more effective Caribbean fishery management since FADs have been introduced.

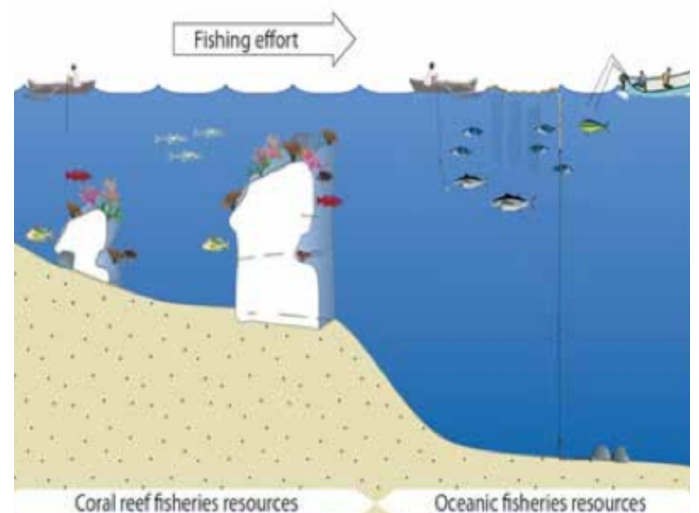
Improved access to pelagic fish stocks not only brings small-scale fleets into direct competition for harvest with larger commercial fleets, but it also causes intensifying conflict with recreational fishers who fish around FADs to benefit from the increased catch rates. Reliance upon FADs and these conflicts highlight both the declining availability of fish to both sectors, and the short term rational of congregating remaining fish to mask the true status of the declining fish stocks. Ultimately, FADs increase fishers' own capacities to fish themselves out of future livelihoods, while unmanaged FAD deployments can only provide short term respite from the impacts of ongoing overfishing. The modern requirement of FADs to maintain prior livelihoods support should be a large concern to fisheries managers, while it must become widely recognized that FADs tackle the symptoms, rather than the causes, of stock declines. Large fishing vessels can catch fish more cost effectively, but small-scale fisheries provide more critical support to many more individual fishers, particularly in poor coastal communities. Smaller or juvenile fish of many species, that can be more economically and nutritionally valuable at larger sizes, are often the most effectively congregated around FADs. This leads to "growth overfishing", a costly trend where individual fish are harvested at a size smaller than what would provide maximum socio-economic benefits.

Through congregating pelagic fishes, FADs increase the relative Catch Per Unit Effort (CPUE) achieved in associated fisheries; the benefit making them so popular. Catching more fish in less time provides clear financial benefits, but also causes one of the greatest sustainable management issues faced by fisheries managers in modern times. The CPUE is a key indicator of fish abundance in stock assessment models, and therefore directly informs how fisheries managers determine the sustainable limits to which stocks can be fished. Fishers using FADs have artificially "hyper-inflated" CPUEs, which actually reflect a FADs ability to congregate fish rather than providing a metric for the number of fish in a stock. This can hide dangerous stock declines and prohibits comparisons to historical (pre-FAD) data.

Because FADs change stock assessment results in an optimistic direction, fisheries scientists and managers may only record declines in a FAD fisheries catch when the stocks approach collapse. This is further promoted by another worrying issue linked to FADs, which is termed the "basin effect". Fishing in a stock's primary habitat (or site of congregation) does not reflect what is happening to the stock in its broader distribution. Therefore, catch rates around FADs do not reflect reality, and FADs actually compound the fishery sustainability issues for which they are being widely promoted as solutions.



Source: Caribbean Regional Fisheries Mechanism



Source: Secretariat of the Pacific Community

So what is the Caribbean Billfish Project doing about these issues?

The Western Central Atlantic Fisheries Commission (WECAFC) is implementing the Billfish project for FAO. It aims to use the very high value recreational fishers have for billfish, to implement new management options for these species that promote win-win scenarios for all fishers. Recreational fishers minimize their impacts upon billfish stocks by following best practices and releasing the billfish they capture. They also support an industry worth at least USD 190 billion per year, from which the Caribbean is well-positioned to benefit. The challenge is in ensuring that sustainably capturing the maximum value of billfish from the recreational fishery sector does not leave commercial and artisanal fisheries unable to continue to receive their own important livelihood and food security support from fisheries. The final layer to this issue is that this livelihood support is vanishing each year that unsustainable harvests continue in the region, as is potential foreign investment and revenue available from the recreational fishery sector. Sustainability is in the interest of every fisher and sector, even if it means a reduction in catch quantity with compensating market efficiency improvements to also increase the value per fish for other species, and stricter fishery controls in the short term.

Following ICCAT recommendations, circle hooks are being tested within the longline fleet of Grenada. Circle hooks capture animals in the corner of their mouths, away from their gills, stomach or eyes. This can improve catch rates, while also not killing animals on the line. Keeping tunas alive on the line improves their flesh quality and value, while live bycatch species can be successfully released to minimize unwanted ecosystem impacts. Results show that circle hooks catch more tuna and improve the average quality and value of harvested tunas, while also keeping more billfish alive at gear haul-back to allow their ICCAT suggested successful release when required to stay within sustainable quota allocations. Keeping fish alive on the line by using circle hooks also reduced scavenging losses from dead fish. A summary video of the Grenada trials can be viewed online at - <https://www.youtube.com/watch?v=BcNZ7M0TDmc>

Recreational fishers have displayed great willingness to pay for systems that will implement innovative management that secures the sustainability of billfish stocks harvests around Caribbean FADs, while also ensuring small-scale fishers retain the livelihood support they require. Innovative, secure and broadly agreed management mechanisms are being developed through ongoing stakeholder engagements. The project developed Caribbean Billfish Management and Conservation Plan also compiles the information collected and will guide sustainable regional billfish stock management throughout the region in future.



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