



REGULATION AND SUSTAINABLE MANAGEMENT OF PARROTFISH IN JAMAICA

Excerpts from a letter to Senator Matthew Samuda outlining the position of the Jamaica Environment Trust (JET) and the other listed signatories as it relates to the regulation and sustainable management of parrotfish in Jamaica

Background

Recently there have been renewed calls on the Government of Jamaica (GOJ) to implement a ban on the harvesting of parrotfish in Jamaica. The resurgence of this issue has featured heavily in traditional media outlets and online in social media, attracting the support of many Jamaicans from a broad cross section of society. The outpouring of support for such a ban from Jamaicans comes after much public education and advocacy on parrotfish management by non-government and community based environmental organizations, academia and Corporate Jamaica.

In an article in the Jamaica Gleaner on Wednesday October 17, 2018¹, it was revealed that Jamaica's environmental regulatory agency, the National Environment and Planning Agency (NEPA), had arrived at a position on a proposed parrotfish ban in 2017; however, the Fisheries Division of the Ministry of Agriculture was not in support of their proposal and no way forward on this issue has yet been determined.

The Jamaican coral reef fishery is heavily overexploited and in urgent need of regulation and management.² Currently, the fishing of parrotfish and other important coral reef fish species is not managed or regulated in Jamaica. There are no open or closed seasons, minimum or maximum size limits (slot limits), temporary or permanent bans.

¹ Livern Barrett, Senior Gleaner Writer. NEPA Was Close To Parrotfish Ban, Says Agency Head. Published online: Wednesday, October 17, 2018 - 4:19 PM <http://jamaica-gleaner.com/article/news/20181017/nepa-was-close-parrotfish-ban-says-agency-head>

² Caribbean Marine Biodiversity Program. Report: Literature Review of Length at Maturity of Jamaican Reef Fishes. Submitted by Prof. Mark H. Tupper, May 7, 2017. Retrieved from: https://www.academia.edu/34057976/Caribbean_Marine_Biodiversity_Program_Report_Literature_Review_of_Length_at_Maturity_of_Jamaican_Reef_Fishes

The existence of Special Fishery Conservation Areas (Fish Sanctuaries) where removal of any marine species is banned provides some opportunity for recovery; however, these no-take zones are small and generally lack the levels of investment, resources and enforcement needed to recover depleted reef fish stocks.

For several years there has been growing support for parrotfish regulation in Jamaica from members of the scientific community (both local and overseas), civil society and the general public. With Jamaica's new Fisheries Act being passed and enactment soon to follow, it is an opportunistic time to establish regulation for more ecologically sound management of our fisheries. Parrotfish being one of the main coral reef fish caught in Jamaica needs to be managed with a clear strategy developed for its management.

Many small-scale artisanal fishers in Jamaica have become very dependent on the parrotfish fishery; however, impacts on the fishery emanate from several other sectors of the Jamaican society and economy. Any management strategy for parrotfish should therefore not only engage small-scale fishers, but also this wider group of stakeholders, to arrive at and participate in effective solutions.

1. **Parrotfish are important for maintaining healthy coral reefs and beaches.** Parrotfish are herbivores which feed on the marine plants and algae that live on coral reefs. When we take out too many of the fish that keep the algae under control (like parrotfish), the living coral reef gets choked and smothered. The collapse of grouper and snapper fisheries in Jamaica in the 20th century led to fishers making the switch to harvesting herbivorous coral reef fish, particularly parrotfishes. The resulting intense pressure on parrotfishes and other grazing marine species has contributed to overgrowth of algae on Jamaica's coral reefs.² Healthy coral reefs are important for small islands like Jamaica, especially in the face of rising sea levels and the increased frequency and strength of hurricanes due to Climate Change. Coral reefs offer vital protection for coastal areas by reducing storm damage, coastal erosion and flooding. They are also a habitat for marine life and support our local economy through fishing and tourism. Caribbean corals have declined by more than 50 per cent since the 1970s and may disappear in the next 20 years as a result of the loss of parrotfish and sea urchin — the area's two main grazers.³

Parrotfish also produce sand. When they clean the reefs of algae, they also chip away at the calcium carbonate skeleton of the coral reef, grinding it up in their stomachs, and excrete sand. This is particularly important for maintaining beaches in areas prone to coastal erosion.⁴

Although managing parrotfish is not a panacea for protecting Jamaica's coral reefs and beaches, which are degraded by other factors as well (e.g. sedimentation, land-based pollution, Climate Change, damage from boat anchors and bad fishing practices), regulating their catch is an important step towards sustaining the health of reefs and providing high-quality habitat for reef fisheries. According to a 2017 study by researchers from Scripps Institution of Oceanography (UC San Diego), the decline in herbivorous fish such as the parrotfish over the last several decades is considered a major factor in the shift to more algae-dominated reefs in the Caribbean.⁵ Parrotfish management is therefore

³ Jackson JBC, Donovan MK, Cramer KL, Lam VV (editors). (2014) Status and Trends of Caribbean Coral Reefs: 1970-2012. Global Coral Reef Monitoring Network, IUCN, Gland, Switzerland. Retrieved from https://cmsdata.iucn.org/downloads/caribbean_coral_reefs_status_report_1970_2012.pdf

⁴ NOAA. How does sand form? Retrieved from <https://oceanservice.noaa.gov/facts/sand.html>

⁵ Katie L. Cramer, Aaron O'Dea, Tara R. Clark, Jian-xin Zhao, Richard D. Norris. Prehistorical and historical declines in Caribbean coral reef accretion rates driven by loss of parrotfish. Nature Communications, 2017; 8: 14160 DOI: 10.1038/ncomms14160

critical to maintaining healthy coral reefs, and there is an urgent need for replenishment of parrotfish populations in Jamaica to ensure reef resilience.⁶

2. **Management of Jamaica's parrotfish fishery could take various forms.** As fish stocks in Jamaica declined over the past century, Jamaican fishers began harvesting smaller parrotfish, and catches now contain a high proportion of juvenile parrotfish which have not yet reproduced - further exacerbating Jamaica's overfishing problem. Fisheries management must be focused on sustaining the fish stocks, as benefits can only be derived once the fish and their habitat are healthy.
 - i. One solution to dwindling parrotfish stocks could be the **temporary closure of the fishery** to allow them to recover – a parrotfish closed season or parrotfish moratorium for example. The closure of the fishery would also have the added benefit of allowing responsible agencies the time to more closely monitor the fishery and examine scientific data to design long-term strategies for parrotfish conservation. This strategy would need to be preceded by meaningful engagement with all stakeholders and backed by financial and social support for displaced fishers in the small-scale artisanal sector.
 - ii. The **enforcement of slot limits** on the parrotfish fishery is another strategy. A 2016 study⁷ found that coral can remain resilient if less than 10% of the fishable parrotfish are harvested and a minimum size of 30 cm is implemented on fishers catch. Leaving the larger breeding fish in the water is also important.² Parrotfish size limits would therefore ideally include a both a maximum and minimum length (slot limits). Using this strategy, parrotfish that are between 30 and 50 cm long – head to tail – could be harvested. This would allow younger fish to grow, and bigger fish to produce offspring to replenish the stock. The implementation of this strategy would require significant levels of enforcement, but it could be very effective in its impact.
 - iii. **Restricted or banned fishing practices** are another option. Some of the healthiest Caribbean coral reefs are those that have restricted or banned fishing practices that harm parrotfish.¹ These include the Flower Garden Banks National Marine Sanctuary in the northern Gulf of Mexico, Bermuda and Bonaire. According to a 2014 IUCN study³ parrotfish are the most effective grazers on Caribbean reefs but vulnerable to all fishing gear types except hook and line. The greatest reductions in parrotfish populations in the Caribbean have occurred where fish traps (fish pots) were the favoured gear, although low catches using this method in recent years have resulted in increased spearfishing.
 - a. **Gear restrictions**, for example **minimum mesh sizes** for fishing nets and/or fish traps, have been scientifically proven to improve fish stocks in Jamaica.⁸ Larger mesh diameters, 2 to 2.5 inches, allow juvenile fish to escape and grow to breeding sizes, thus increasing the overall population of parrotfish.² Larger mesh sizes will also reduce accidental capture of juvenile parrotfish in pots. Using this approach, fines for non-compliance would be imposed on fishers, and fishing nets or pots not meeting legal requirements would be confiscated and/or destroyed. An

⁶ Resilience is the capacity of an ecosystem to respond to an agitation or disturbance (e.g. a storm or disease) by resisting damage and recovering quickly. In ecosystems with low resilience, a single shock could have very devastating effects.

⁷ Bozec, Y. M., O'Farrell, S., Bruggemann, J. H., Luckhurst, B. E. & Mumby, P. J. Tradeoffs between fisheries harvest and the resilience of coral reefs. Proc. Natl Acad. Sci. USA 113, 4536–4541 (2016). Retrieved from <http://www.pnas.org/content/pnas/113/16/4536.full.pdf>

⁸ Woodley, J., Z. Sary and P. Gayle. 2003. Fishery Management Measures Instituted at Discovery Bay, Jamaica, with Special Reference to Establishment of the Fisheries Reserve. Gulf and Caribbean Research 14 (2): 181-193. Retrieved from <http://aquila.usm.edu/gcr/vol14/iss2/15>

assessment of the minimum mesh size limits that allow all juvenile fish to escape would need to be conducted to inform the gear restriction. The restriction would need to be implemented and enforced without prejudice, for this strategy to achieve success.

- b. Another example of gear restriction is imposing a **ban on certain types of fishing gear**. In some areas of the wider Caribbean (for example Bermuda and the Exuma Cays Land and Sea Park in the Bahamas, Belize and Bonaire), active gear management including **bans on fish traps**, has led to increases in parrotfish numbers and consequent improvement in reef health⁹ In Jamaica fish traps are popular among the artisanal fishing industry; therefore if this strategy was pursued, it would require significant financial and social support for displaced fishers. An alternative approach to an outright ban on fish traps could involve **a moratorium on new licenses being issued by the Fisheries Division to fishers who use fish traps**.
- c. In Jamaica large quantities of parrotfish are shot by spear fishers while the fish are sleeping at night in their mucous cocoons.⁹ **Banning the commercial capture of parrotfish using spear guns**, restricting spear guns to licensed recreational fishers, and limiting the number of parrotfish which could be harvested by recreational fishers could address this problem. Spearfishing at night is already banned in Jamaica, however increased awareness and enforcement of this regulation is needed.
- d. **Returning any juvenile parrotfish caught to the sea**. This would have to be done immediately to keep the fish alive. From a regulatory standpoint, juvenile parrotfish would never be landed. Any ban on parrotfish landings should keep in mind that they constitute between 25 to 40% of fish pot catches in some locations in Jamaica. Additionally, parrotfish often die from barotrauma (“the bends”) and handling when they are pulled up in nets/pots and thrown back. There is also some debate among the scientific community whether fish which have suffered injury should be returned to the sea. Returning injured fish to the sea retains the biomass (and energy) in the food chain, but some feel that this is an impractical approach due to the reasons stated above.

Most importantly, whichever parrotfish management strategy or combination of strategies is pursued by the GOJ must be grounded in the best available science, with adequate financial and technical support, and should also include rigorous monitoring and evaluation of its effectiveness.

3. **Parrotfish management must be complemented by other fisheries conservation strategies:**
 - i. **Increasing the number and size of Fish Sanctuaries and Marine Protected Areas (MPAs)** in Jamaica, and increased investment in their management and operations. This will have the benefit of protecting parrotfish as well as other marine species and habitats. At a minimum, 20 – 30% of Jamaica’s marine fishable space should be allocated as “no-take” zones. These no-take zones could potentially be established along the entire length of Jamaica’s coastline to include all mangroves, seagrass and near-shore reefs.
 - ii. **Strict enforcement** of fisheries regulations - strengthening of enforcement efforts by the Fisheries Division under the new Fisheries Act as well as strengthening the enforcement within existing and newly established Fish Sanctuaries

⁹ Alexandra S. Grutter, Jennifer G. Rumney, Tane Sinclair-Taylor, Peter Waldie, Craig E. Franklin. Fish mucous cocoons: the ‘mosquito nets’ of the sea Biol. Lett. 2011 7 292-294; DOI: 10.1098/rsbl.2010.0916. Published 11 March 2011 Retrieved from <http://rsbl.royalsocietypublishing.org/content/7/2/292>

- iii. **Increased investment in the local fishing industry** to allow targeting of larger offshore species
- iv. **Broad stakeholder consultation** on any strategy to be implemented
- v. **Public education** on the importance of conserving the parrotfish

Strategies to address other major factors contributing to the decline in Jamaica's fisheries (e.g. pollution from land-based sources and the destruction of key fish habitats) need also be established.

Proposed Parrotfish Management Strategy

Given the scale of the Jamaica's parrotfish decline and impacts to our coral reefs, we recommend the following strategies be pursued by the GOJ:

Immediately

1. **Present the case to the Senate that parrotfish management is an urgent priority** requiring expertise, action, accountability, a focus on science, enforcement and sufficient resources. The importance of parrotfish for the health of Jamaica's coral reefs and fisheries, and not only their social and economic value, should also be acknowledged. The case should be presented in the context that the recent passing of the new Fisheries Act provides the legal framework to implement regulations to restore and sustain the parrotfish (and other species).
2. **Establish a standing inter-ministerial planning and monitoring committee**, consisting of marine conservation scientists, fishing industry representatives, fishing cooperative representatives, civil society representatives, academics and government stakeholders to provide oversight to the development and implementation of the GOJ's regulatory framework for parrotfish management.
3. **Stakeholder consultations to identify practical management solutions** that take into consideration the sustainability of the parrotfish fishery and the livelihoods of fishers.
4. **Review and update existing socio-economic research on the Jamaican men and women who make their livelihoods fishing parrotfish** and establish structures to ensure their input into plans going forward.
5. **Begin work on the economics.** How is the parrotfish management strategy to be funded, by whom, how will we ensure that the solutions are appropriate and feasible, and what options will be made available for alternative livelihoods for fishers, vendors and restaurant owners currently dependent on parrotfish.

Within six (6) months

6. **Launch a national public education campaign to raise awareness about the impending parrotfish management programme** targeted at fishers, vendors, restaurant owners and the general public.
7. **An appropriate grace period, and notice of the chosen strategies should also be widely publicized** to allow fishers to adjust.
8. **Review the management and operations at the Fisheries Division.** Fisheries Division should focus on its role as conservator of fisheries - protecting the health and sustainability of fish stocks and enforcing fisheries regulations.
9. **Establish a rigorous national monitoring and evaluation programme** to conduct frequent and regular assessments of Jamaica's parrotfish populations. Monitoring must use best available scientific approaches that are rigorous and producing information that is globally comparable. Monitoring and evaluation should establish baseline data and then place emphasis on determining the effectiveness of strategies as outlined in 10 – 12 over an 18-month period.

Within twelve (12) months

10. **Impose minimum mesh size restrictions for fishing nets and/or bans on fish traps (pots).** Mesh sizes no smaller than 2 inches are recommended in the first instance, although research should be conducted to confirm the appropriate mesh size to correspond to the minimum size of fish caught.
11. **Regulate spearfishing. The ban on spearfishing at night should be strictly enforced. A licensing regime should be implemented** for spearfishing guns, which should only be issued to recreational fishers. Strict catch limits for recreational spearfishing should be enforced.
12. **Increase the size and number of fish sanctuaries supported by GOJ in ecologically important areas.** A set allocation for sanctuaries should be provided for in the annual budget expenditure. Sustainable financing of sanctuaries is key to their effective management. An increase to 10% of Jamaica's marine fishable space should be allocated as "no-take" zones in the first year, with a 5% increase each year thereafter until the target of 30% is attained.
13. **Establish an Alternative Livelihoods Programme for Fishers** to be delivered concurrently with strategies 10 - 12. The World Bank funded *Promoting Community-Based Climate Resilience in the Fisheries Sector* project¹⁰ which is currently being implemented by the GOJ¹¹ is a possible avenue through which such a programme could be established.

Within twenty-four (24) months

14. **Inter-ministerial planning and monitoring committee to review the results of the national parrotfish monitoring and evaluation programme (as outlined in 2 and 9) to determine whether a temporary closure of the parrotfish fishery should be imposed** under the Fisheries Act and Natural Resources Conservation Authority Act, i.e. a moratorium on the harvest of parrotfish.
 - i. **If the implemented strategies (10 – 12) have been deemed effective by the committee, and a moratorium is unnecessary,** annual parrotfish counts and size assessments should be conducted to provide updates on the health of the parrotfish fishery to the relevant agencies.
 - ii. **If the implemented strategies (10 – 12) have been deemed ineffective by the committee, and a moratorium is necessary,** the temporary ban should last for two to three years, to allow parrotfish to return to sustainably harvestable levels. The moratorium should be led by the National Environment and Planning Agency (NEPA) with enforcement and monitoring support from the Fisheries Division and the police. Significant investment will be needed to prepare Jamaica for the ban, including the provision of support for small-scale fishers whilst the ban is in place, designing a practical means through which the ban can be enforced (e.g. gear restriction), and a national public education campaign on the ban.

Once it is determined with the support of data from the national parrotfish monitoring and evaluation programme that parrotfish populations have recovered, then sustainable harvesting can resume, under strict sustainable management regulations:

- Size limits should be imposed for parrotfish catches. Only parrotfish that are between 30 and 50 cm long – head to tail – should be allowed to be harvested going forward. This strategy recently received public support from marine scientists

¹⁰ Promoting Community-based Climate Resilience in the Fisheries Sector:

<http://projects.worldbank.org/P164257?lang=en>

¹¹ JIS News. Grant to Help Vulnerable Fishing Communities. Published March 29, 2018. Retrieved from:

<https://jis.gov.jm/grant-to-help-vulnerable-fishing-communities/>

at the Caribbean Marine Biodiversity Program's Sustainable Fisheries Forum (with a focus on parrotfish) hosted by The Nature Conservancy and Sandals Resorts International in April 2018.

- Strict limits on the number of parrotfish which can be caught should also be enforced
- Annual parrotfish counts, and size assessments should be undertaken to monitor the parrotfish population. If it is determined that parrotfish counts have declined to near unsustainable levels, a closed season for parrotfish should be piloted to determine the feasibility and effectiveness of that strategy. Failing the effectiveness of a closed season, a second moratorium should be implemented until parrotfish populations have recovered.

We believe that if Jamaica continues to fail at taking hard management decisions to address our dwindling parrotfish stocks, then the problems of depleted fish stocks, degraded coral reefs and reduction of beach sand replenishment will only worsen. The economic implications will extend beyond fisheries, as a degraded marine environment will impact tourism, food security and our resilience to Climate Change. The Fisheries Division, NRCA/NEPA and other related agencies must be held accountable to protecting Jamaica's fish stocks. The poor state of fisheries in Jamaica requires bold and decisive action.

If successful, this framework and lessons learnt can be used to effectively develop similar strategies for other fishable species in Jamaica and the wider Caribbean region.

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