To Impact or to Overfish?: A Rebuttal

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The primary purpose of my review was to demonstrate that there is no scientific evidence to conclude that overfishing was a widespread phenomena in the Caribbean during prehistoric or colonial times, or that these earlier activities altered the basic structure of regional marine ecosystems. However, as Sharyn Jones correctly pointed out, I did not wish to replace one myth with another, nor replace the idea of a humanized seascape with earlier notions of the "noble savage" and an unaltered wilderness. William Keegan (2010) also shares this view when he expressed, "The native peoples of the Caribbean may have not been good shepherds, but they lacked the technology to completely devastate marine ecosystems."

I regret if I gave the impression that the importance of historical and archaeological data in fisheries research and management should be diminished, and that Virginia Butler (2010) interpreted my phrase that the actual fisheries crisis is rooted in, but does not belong to the past, as a statement that the archaeological record cannot help to address the contemporary crisis in fisheries. Please let me digress. In 1987, several years before Pauly (1995) wrote his seminal paper on the shifting baseline syndrome and suggesting to fisheries scientists that they should seek the past to help answer questions about today's problems, I published a series of articles on Cuban fisheries history, including those aboriginal in nature. This was a helpful experience for me as it helped explain to fisheries managers how fishing activities might impact marine ecosystems and the need to manage them. What I hope to convey here is that I understand the importance of history in examining these issues and that this has helped not only me to comprehend these complex issues, but also the fisheries managers in my own country.

Let me address comments from the other Forum participants. Susan deFrance (2010), which provided several critiques of my paper misquoted my statements. I was not questioning the value of archaeological research, but the simplistic interpretations of the data and various methodological constraints. I did not write that Maisabel (Puerto Rico) and Trants (Montserrat) are unique cases of larger settlements in the Caribbean—they were simply mentioned as examples. Neither did I argue that the prehistoric Caribbean was exclusively inhabited by low-density nomadic hunters and gatherers or that the inability to identify faunal remains to the species level makes trophic level analysis and interpretation of technology problematic. However, identification at the species level is fundamental when interpreting average size of the samples because of potential large differences between species within the same genus. I also did not state that there was a pan-Caribbean shift to the use of inland terrestrial resources. It is unfortunate that deFrance (2010) did not critically examine my review. Otherwise, she would not have concluded that I grossly simplified the nature
of prehistoric populations of the Caribbean, their technology, and potential impacts. In contrast to her statements, I did in fact acknowledge possible ancient and historical impacts over Caribbean marine resources. However, she seems to confuse fisheries impacts with overfishing, a common misinterpretation that I further discuss below.

It also appears that McClenachan et al. (2010) did not really comment on my review, but instead provided new arguments and references to reinforce their previous views. This was likely a result of my paper being based on “superficially scanning of a few accessible documents”, instead of their own “rigorous historical analysis.” Therefore, I am not able to convey the same kind of argument. As such, I have chosen not to discuss the scientific methods used in historical research or the validity of the different sources. What seems necessary instead is to emphasize that although we have both used the same historical sources, there are such a large number of inconsistencies that this prevents me from supporting a hypothesis of overfishing. It is disappointing that none of these arguments were addressed in their comment, despite the fact that I provided evidence that their green turtle abundance estimates are unreliable because they were based on what I interpret to be very limited and biased information.

For example, turtle meat was not an important food in Jamaica or the rest of Caribbean prehistorically or historically. Monk seal was not an abundant or resilient species in the region. During colonial times, sharks were fished occasionally, but never intensively. Salted cod was not imported because coral reef fishes were overexploited and there was no fish by-catch. Traditional and historical fishing technologies did not cause ecological damage to reef systems. Marine metapopulations have proven to be more resilient to human exploitation and intervention than terrestrial ones. There were no ice or motor engines which allowed for more intensive fishing and spawning aggregations were not accessed from many fishing areas.

What all of these show is that the Caribbean Sea had plentiful natural reserves, allowing fish species to rapidly recover from local impacts or even from episodes of overfishing. It is widely recognized that marine reserves are critical, not only because of their value in countering uncertainty, but because they provide resilience against overexploitation by allowing natural systems to regenerate and act as a huge reservoir of large high-value species (Pitcher and Pauly 1998). In a recent article, Mumby and Harboge (2010) demonstrated the recovery of a heavily depleted Caribbean coral community in a well-protected marine reserve. With all of these arguments in mind, it is possible to paint a more realistic picture of Caribbean marine environments during colonial times, than that insistently conveyed by McClenachan et al. (2010). This conclusion cannot, however, be simplified by saying that human impacts have not affected some of the more vulnerable species or that impacts intensified over time.

We must also be very careful with the use of some terms to support our views or to criticize other research. In their comments, for example, McClenachan et al. (2010) conclude that, “Spanish commerce extirpated species of great value such as the pearl oyster”. In fact, the Spanish did not extirpate the species, because they only overfished the pearl oyster beds from a small locality in Cubagua Islands, Venezuela. This is important to note because this is highly localized and should not be compared to the entire Caribbean when examining possible impacts from fishing. Accounting for examples like this, in my review I have written that, even in those cases where the abundance of some sedentary species might be locally depleted at a reduced spatial scale (like the pearl oyster), they cannot be considered overfished in a wider context. As Keegan (2010) correctly pointed out, overfishing is not an outcome, but a process.

It is not that I am unreluctant to recognize the impacts of aboriginal or European colonizers on some Caribbean fishery resources, but I propose that they were just the beginning of an accelerated and intensified process. Fishing in the early stages of development likely just approximated natural predation (Stergiou 2002). The extension, as well as the intensity of fishing activities

JOURNAL OF ISLAND & COASTAL ARCHAEOLOGY 171
was not a linear, but an exponential process, dramatically accelerated over the last six decades. To insist on the overexploitation of fish species by aboriginal people or European colonizers, despite the scarcity of scientific evidence to support it, does little to contribute to restoration goals or assess population changes. Knowing as we do the status of the Caribbean ecosystems after 1950, the only conclusion that can be drawn from those statements about overfishing is that tropical marine resources are much more resilient to human exploitation than we have all imagined. As I noted, this is a dangerous conclusion, which may also hide our actual responsibilities in encouraging overfishing.

Overall, I think that through my paper I have simply questioned the well-established myth of an extensive Caribbean aboriginal population when Columbus arrived, and the conclusions that some changes in fossil remains, or that limited pieces of historical information, should be accepted as incontrovertible evidence of overfishing and widespread ecosystem changes. The two most important proxies for assessing human impacts—the size of the population and their technological capabilities—have not, however, been seriously considered in attempts to assess the effects of fishing activities on Caribbean marine ecosystems.

In his comments, Keegan (2010) says that a more compelling goal, for us, is developing an understanding of human ecodynamics in a historical context. I agree with him and I am convinced that the way to approximate ourselves to those changes rest in more integrated work. However, as Sharyn Jones (2010) pointed out, we must also look for more complex answers to those provided by relatively simplistic explanations of human behavior. Finally, I agree with Virginia Butler (2010) that despite some inherent challenges, zooarchaeologists and historians should work with conservation biologists and resource managers to address contemporary issues. I only hope that my paper becomes a small contribution to this effort.

REFERENCES


