

Response to referee 2

General comment

Overall, the paper is well written and deals with an important gap in current knowledge around utilization patterns of mangrove habitats by fish species. The material and methods section is really impressive and authors provide sufficient results to support their conclusions. There are only a few clarifications that need to be done.

Response

We thank referee #2 for insightful comments that improved the manuscript. We carefully addressed each comment below.

Comment #1

For example, how could the correlation between DO and Depth affect the RF model? In the results section authors state that different models were created for each variable, but it is still unclear how the model is affected by this correlation.

Response

There is no agreement on how correlated variables impact the prediction of Random Forest models (Grömping, 2009; Neville, 2013). However random forest is a very robust method, and in this study, considering the large dataset used with only few predictors that are all relevant to explain fish assemblages, we believe that overfitting is not an issue. Moreover, the two different models created, one excluding depth and one excluding DO, confirmed that both variables substantially increased the prediction capacity of the model.

Comment #2

Also, in results, lunar phase was the second most important variable in explaining species richness, and although it seems to be an important result, there is no further discussion on this.

Response

The effect of lunar phase on fish assemblages has been discussed in detail in Dubuc et al. (2019), therefore the discussion of this paper focuses on water depth and DO, that are two factors potentially responsible for the main tidal variation pattern identified in fish assemblages. A sentence has been added at the beginning of the relevant discussion section to clarify this point: “The effects of lunar phase and location on fish assemblages were investigated in detail in Dubuc et al. (2019), therefore the following discussion focuses on water depth and DO, that both varied at a tidal scale.”, p.10 lines 2-3.

Comment #3

In results (page 9) and discussion 4.3 section (page 11) authors state that tolerance groups were represented by different groups of species (with reef associated taxa having low tolerance behavior). However, this statement is not further explored. Resident and vagrant fish are likely to differ in the way they use mangrove habitats, so, how DO may affect their patterns of utilization?

Response

This is an important result, and this discussion section has been extended and modified to emphasise it: section 4.3 p.11-12. We believe that species able to extensively use mangroves are able to do so partly because they are highly tolerant to hypoxia and probably highly tolerant to environmental stressors in general.

Comment #4

The discussion section ends with the following statement “This could explain why relatively few taxa venture inside the forest, and those that do, appear to be highly tolerant to hypoxia” (page 11), but there is no previous information on spatial distribution of fish species between both environments. Moreover, although no differences in DO was found between in forest and edge samples, what about the other environmental variables? Looking at table 1, it seems like water depth may differ between both sites, which could explain the lower species richness.

Response

A result section has been added to highlight the difference in fish taxonomic richness between the in-forest and the edge, showing that less taxa were observed in-forest: p.7, lines 33-34. Relevant references have also been added to support this point: p.11, line 31. We agree with your comment, and indeed differences in water depth, especially the fact that in-forest sites get exposed at low tide while edge sites remain submerged, could explain differences in taxonomic richness. This point was thoughtfully discussed in another paper (Dubuc et al., 2019).

The relevant paragraph in the discussion has been modified to provide more information regarding this point:
p.12, lines 20-27.