Review of: Weight-at-length of the invasive lionfish Pterois volitans (Actinopterygii, Scorpaenidae) in the Central Mexican Caribbean, and a review of allometric growth parameters across the invasion range

NB. This journal requires anonymous review, and I clicked on the link contained within the paper to where the raw data and code was hosted to look at the raw data and code without thinking and found out the authors identity inadvertently.

General comments:

Paper feel quite long for it's findings, but I think that's because it's English, while ok, could be tightened up a lot. I would suggest a native English reader, or someone with extensive scientific writing in English should give it a good copy edit to tighten.

Why do you find spatial variation in weight-at-length between difference regions in the western Atlantic. A brief discussion of the literature on factors affecting weight-at-length and linking at any evidence in lionfish (if any) would be good in the discussion.

While generally good as a paper, I think it could be more interesting if they considered some other factors other than just geographic variability in length-weight parameters. For example, the author data spans shallow reefs to near-mesophotic depths. There's also plenty of published studies that contain raw data in their supplementary materials which allows length-weight relationships to be looked at across depth. Though I appreciate this is a different question to what the authors have set out to address, so is not required for this paper, but just would be an interesting addition if the authors were interested.

Some of the in-text reference formatting needs sorting. There's quite a lot of minor spelling mistakes and capitalization mistakes (including in the abstract).

L1 - Title is very long, I'd suggest simplifying it, something like: Allometric growth parameters for invasive lionfish in western Atlantic

L20 - Note to editor - I have not been able to review this Spanish abstract.

L36 - surely lionfish and Pterois should be key words?

L38 - While it's nice to have a general opening paragraph, I don't think much of the information in this first paragraph is that important to framing the paper as the economic impacts of invasive species/risk to native biodiversity is very variable depending on the invasive species and the geographical context. As this paper is on length-weight relationships in lionfish specifically, rather than broader invasive species impacts, I would cut this whole first paragraph and open with a slightly revised version of the second paragraph which introduces the lionfish invasion.

L46 - lionfish have invaded south of the equator in Brazil, I would just say western Atlantic rather than North-Western Atlantic

L48 - clarify that they are the first know invasive marine vertebrates to establish in this region. As I think there may be other fish that have established prior to lionfish but not become invasive.

L51 - Add additional habitats: seagrass beds (several possible refs e.g. Claydon et al 2012 MEPS), deep sea (Gress et al 2017 PeerJ). Maybe cite Andradi-Brown et al 2017 Biological Invasions for this mesophotic reference, as that contains a review of their presence on MCEs in the region so is more appropriate for this point.

L52 - 'threat to local biodiversity' - I think this needs a dedicated sentence to explain what their threat is

L55 - you cite a lot of papers saying that work has been done, but don't explicitly say what the main diet competes of lion fish are. You talk about their presence reducing native fishes without saying that's because lionfish eat them. Also mention inverts that are fed on by lionfish. This should be added to this paragraph

L72 - be clear you're talking about recovery following culling

L78 - see Chapman et al 2016 Marine Policy

L84 - I think you need to be clearer here that for the equation that you're talking about individual fish lengths to generate biomass, as in the preceding couple of sentences you are talking about sum biomass of the whole lionfish population

L94 - you should read and probably cite Green et al 2014 Ecological Applications paper on threshold for lion fish removal

L124 - dives not immersions

L126 - did you have any bias in your collection using hand nets? I.e. were smaller fish easier to catch than larger fish (the reverse of the bias common when spearing lionfish for collection). I'm also a little worried that the majority of other parameters you compared to have been calculated based on lionfish data that were collected by spearing. So if you have concerns here about blood loss affecting estimates, then does this mean that the other estimates you compare your results to are actually not comparable? (Note, I don't think this is really a big problem, but I think it's worth a couple of sentences somewhere to address)

L126 - be clear you mean all lionfish when stating 'all organisms'

L129 - add any ethical review (if appropriate) of this method for killing lionfish

L157 - where does fishbase source their estimate from? This is normally based on a a bayesian weighted estimate of parameters reported in the literature (I think). So ensure that none of the studies that you are directly comparing have gone into this fishbase estimate, and probably cite the original studies stating that they contributed to the fishbase estimate if that's possible.

L180 - can this raw data and code be cited in a version controlled way. Maybe the final code and dataset should be uploaded to a repository where it can be cited by doi to an exact version?

L182 - just be clear this is the Mexican Caribbean samples you collected

L187 - how did you calculate the skewness

L192 - please format the degrees of freedom correctly

L271 - be clear what studies you mean when you say 'these same studies'

L275 - if hand nets really are better I think you need to provide more justification of this point and the implications. The vast majority of Caribbean lionfish data is collected by pole spears, you're advocating for changing this (which is embedded into many government lionfish management plans). I think this needs a stronger paragraph on why this is important.

L292 - briefly remind readers the difference between eq.1 and eq. 2 here, and make sure they are clearly labelled as 1 and 2 where you present the equations in the manuscript

L294 - it would be useful to identify which studies incorrectly label their estimates as for eq. 1 or eq 2., and also which studies say they present mm-to-g conversions that are actually cm-to-g so that any readers referring to your paper know which original papers to be aware of these problems in. I think this can be done in a relatively neutral way without being too critical of the original papers.

L306 - 'command' should be 'function' as this is the correct term for in R

L307 - I would advocate cm-to-g as standard for conversion constants, as this is how fishbase presents estimates for all species, and is most widely used for fishes when thinking of species other than lionfish

L320 - I suggest making data and code available in a version controlled way, and if posted in an online repository or cloud data storage, this should be archived properly and allocated a doi that it can be cited under, to ensure stability of access in the future.

Table 1 - maybe number the locations and indicate with numbers which is which on Figure 1

Fig 2 - please confirm the band-width for the kernel density plots. I wonder if kernel density is really the most appropriate here, could a simple histogram communicate the same message and be easier to understand?

Fig 3 - I think this can be combined as a third pane in Figure 2 and doesn't need it's own separate figure.

Figure 4 - lines are really hard to see and distinguish, maybe just show up to 300g, and increase the spacing on the y axis so that the lines can be more clearly seen?

Figure 5 - can you add the geographical location of each study onto the plot, and maybe group by geographical regions. As a central point you are making is that different regions have their own similar parameters, but this isn't very obvious from this figure.