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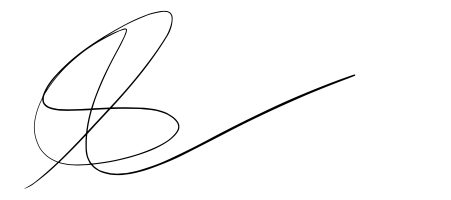
Dear Editor and Reviewers,

We would like to extent our thanks for your time and effort in the technical review of our manuscript. Your constructive feedback has vastly improved the clarity of our work.

In the following document, we have addressed the general comments (you will find our responses in italics under the original text) and have responded to individual comments in the resubmitted manuscript.

We hope you find the improved manuscript satisfactory.

Thank you again for your work, as it has improved our own,



Stephen R. Scherrer

Ph.D. Candidate

On behalf of all authors.

**Overall this paper is well written and provides an improved methodology to estimate growth of an important Hawaiian commercial bottomfish species. It is critical to provide the most accurate estimation of life history parameters for a species that is becoming the benchmark for the stock assessment of the deepwater snapper complex in Hawaii. This species has a long history of marked variability in the estimation of age and growth, primarily due to mixed ageing methodologies and opportunistic sampling. However, advances in radiometric dating has provided acurate longevity estimates for this species. As a result, the present study has successfully evaluated growth using both a Bayesian hierarchical and maximum likelihood approaches to evaluate growth models, while incorporating the data from tagging and radiometric ageing data.  
  
However, I feel three aspects of this study deserve comment and consideration from the authors. First, the authors state the potential bias when estimating growth using mixed ageing methodology (i.e., episodic growth, poor increment resultion for younger ages, and lack of validation) and length frequency analysis. This bias has been noted in recent studies and may be reflected in overestimation of K and underestimation of L∞, or vise versa, especially given potential decoupling of length at age (Newman et al. 2015, Williams et al. 2017). Given this stance by the authors and recent reviews, there should be some discussion on how the incorporation of the biased direct ageing data (from the previous studies) is or is not rectifiyed in the current study. Is it effective to incorporate this biased data into any predictive model? Would you not expect the parameter values in this study to be consistent with previous studies, given the data is the same?**

*Thank you for your review. This study represents the first integrated analysis of all available data sources to age P. filamentosus. While including data from length at age and length frequency studies influenced growth parameters obtained under our integrative modeling approach, their inclusion does not mean that the resulting parameters will directly mirror those of previous studies. In fact, we would expect them to be similar, but would be surprised if the results were identical because of the multiple data sets that were integrated in the analysis. In addition to the OTP mark recapture data (n = 387), the preferred integrative model (Model 11) included direct aging data from otolith micorincrement (DeMartini et al 1994; n = 35), bomb carbon (Andrews 2012; n = 33) and lead:radium sources (Andrews 2012; n = 3), as well as length frequency data from (Moffit and Parrish 1996; n = 13). However, the direct aging data of Ralston and Miyamoto, believed to be the most problematic data sets because it used a method for determining age that involved integrating daily otolith counts to establish a relationship between otolith size and age, was not included under the preferred model. During parameter estimation, the favored model weighed all data sources by the total number of observations in each datasets (rather than first estimating the best fit for each data source and then averaging parameters between them, as was proposed in model structures 6, 8, and 10).*

*Our paper states that age estimates from otolith counts for “early (< 5 years) life stages” may be biased (L69-71), not that all methods for aging methodologies are biased, nor is that bias present for all life stages. The incorporation of this data represents the best available information for early life stage fish and is commonly included in aging studies.*

**Second, subregional variation in age composition has been shown to exist in some eteline snapper species (Williams et al. 2017, OʻMalley pers comm, Nichols 2019), therefore, pooling of ages from both subregions of the Hawaiian Archipelagop should be used with caution. This is especially true if the intention of this study is to describe growth for only the MHI subregion. The potential impact of several centuries of fishing exploitation on age composition of P. filamentosus  is unknown in the MHI; however, it could have an impact when compared to NWHI population.**

*A reading of Williams et al. (Front. Mar. Sci. 2017,* <https://doi.org/10.3389/fmars.2017.00382>) *finds that they do not examine subregional variation in age composition of bottomfish (E. carbunculus) but rather compare growth parameter values between Ocean (Pacific/Indian), Sex (Male/Female), and Latitude. None of their conclusions or analysis were presented regarding longitudinal variation in age parameters similar to the situation in the Hawaiian archipelago. While Nichols’ (2019) recent work on E. carbunculus for the Hawaiian archipelago demonstrated age and size truncation in the MHI population relative to the NWHI, the results of the integrated analysis for P. filamentosus suggest that it was appropriate to include all available data sources as a single population for the model selection process (also supported by genetic data – see Gaither et al. 2011 cited in paper). With that said, we agree that the possibility of regional variation in a population can influence the estimation of growth parameters so we have made clearer in the discussion section where we explicitly discuss spatio-temporal assumptions and whether including this data is appropriate.*

**Lastly, the authors discuss the potential impact sexual dimorphism may have on predicitve ability and potential to underestimates the recapture length due to an averaging of both sexes. Since effective external sex identification methodologies were not in place at the time of this tagging, it is understood that sex-specific data is lacking from analysis. However, the maximum size range for the tagged fish are not representive of the population (Luers et al. 2017). The model sensitivity and impact because of lack of larger individuals (>50 cm) being included is not discussed, but related to sexual dimorphism.**

*The model used to fit tagging data uses a likelihood value obtained from joint density of both tagging and recapture lengths (For details, see Laslett et. al. 2002) meaning that parameters are estimated with consideration to both tagging length and length at recapture. There are 72 individuals in the OTP tagging data with observed lengths at recapture exceeding 50 cm. The sample of specimens used by Luers et al. (2017) had most fish sampled in the range of 35-55 cm FL regardless of sex (pg. 328) with only a few fish over 70 cm which is comparable to our dataset with minimal effects on the estimation on L∞. Additionally, larger size classes (both pooled and individuals) obtained from bomb-carbon and lead:radium data sets (Andrews et al. 2012) are included in in the direct aging components of the integrative models and contribute to the parameter estimation procedure for those models (Models 6-11).*

*A final point, Williams et al. (2017) suggests determinate growth once a fish has attained their asymptotic length, Thus, these fish go on to live a considerable time at a similar size and it is not possible to determine the age of the largest fish from size alone. When growth parameters underestimate the recaptured size of the largest fish, this means that these fish are continuing to grow at a rate faster than predicted. If decoupling of length and age described for this species were to account for this effect, we should instead see the opposite effect, where fish get older but grow at slower rates, rather than growing faster as they approach their asymptotic size. Since we didn’t observe this in the model analysis, it suggests that our results are robust and follow conclusions from prior studies. The growth parameters obtained by Andrews et al. for P. filamentosus were able to address this concern by using radiometrics to validate age (and, in the process, revealed that the life expectancy for this species was significantly greater than previously estimated). These parameters are in very close agreement with the ones we’ve estimated here and similarly underestimate growth in the largest fish. For these reasons, it does not appear that decoupling of age, nor a lack of larger individuals, can account for the consistent underestimation of growth for the largest fish.*