SAY SOMETHING NICE HERE

**Response to Associate Editor’s Comments**

Accepted all suggested edits except for the following (line numbers refer to the Stewart et al 15 AE track changes.docx document):

*Lines 12-14 –* The suggested changes are not consistent with our sampling process. We measured the TL for all fish collected. We then recorded weight and sex and extracted scales and otoliths from a subsample of those fish. The suggested changes imply that we recorded weight and sex for all collected fish, which is not true.

*Line 130 –* We prefer to keep “most” in front of “obvious.” Leaving “most” out implies that the marks were clearly obvious in that region and that was not always the case. Leaving “most” suggests that the marks were not always clearly obvious which was the case.

**Response to Reviewer 1’s Comments**

(Line numbers refer to our original submission … which is the line numbers that this reviewer refers to)

*Major Comment 1* – We moved the weight-length relationship results paragraph to the end of the results to make a parallel organization with the introduction. We kept a size section in the results as it seems important to characterize the lengths of fish observed prior to discussing growth. Thus, the results now have four sections – 1) Age, 2) Size, 3) Growth, and 4) Length-Weight relationships.

*Major Comment 2* – As the reviewer noted, the extra sums-of-squares method that we employed and the information criterion method (e.g., AIC) are both valid model selection methods (as is the likelihood ratio test). However, we disagree that the IC methods will be more familiar to readers. The extra sum-of-squares test is simply an analysis-of-variance. In addition, the likelihood ratio test has been put forward by Kimua (1980) for testing differences in VBGF parameters among groups. Kimura (1990) later showed that the extra sum-of-squares and likelihood ratio tests are functionally equivalent. Thus, our extra sum-of-squares tests will be familiar to readers who are familiar with the analysis of variance and to readers that are familiar with the statistical literature on comparing VBGF parameters. Furthermore, we feel that using an IC method is fundamentally in contrast to the hypothesis/significance testing methods used elsewhere in the paper. Finally, we did not defend our choice of using the extra sums-of-squares tests for the reason above and because we feel that doing so would distract the reader.

*Major Comment 3* -- XXX

*Line 10* – Done.

*Line 23* – Fixed.

*Line 62* – Fixed.

*Line 68-70* – We agree with the reviewer’s comment. We have attempted to address this problem by removing the last phrase (“to determine if growth of Pygmy Whitefish from Lake Superior changed in 60 y”) on this sentence. We think that this change clearly illustrates that we will only be comparing these two sampling events. Please also see our related response to the related comment for Lines 274-276.

*Lines 85-87* -- XXX

*Lines 164-166* – The proper fitting of VBGFs require young and old fish so that both K and Linf can be reasonably estimated. We could not determine the sex of age-1 fish so if these fish had been excluded form the analysis then young fish would not be present to help fit the VBGF for both sexes. We do not have any evidence for the sex ratio of age-1 Pygmy Whitefish. However, our results should not change much unless the sex ratios were dramatically skewed such that the randomizations resulted in a small number of age-1 fish from one end of the distribution being allocated to one sex or the other. We could perform a sensitivity analysis that addresses this question but we believe that is beyond the scope of this paper. Finally, we feel that our method for anchoring the left-side of the VBGF is more defensible (and less draconian) then setting model parameters to constants as has been done in the literature (e.g., see Cailliet et al (2006)).

*Lines 170-176* – Reviewer noted that we did not mention APE and that APE was only found in Table 1. As APE is a constant proportion of ACV, it is a redundant measure. Given this and the reviewer’s comment we have completed removed APE from the manuscript. This required removing a statement in the methods (Lines 135-136), removing a statement in the label for and a column in Table 1, and removing the Beamish and Fournier citation. We moved the sentence that summarizes the ACV to be the second sentence in that paragraph to have a parallel construction with the table (the reviewer suggested changing the table, but we have accomplished the same end result).

*Line 183* – Done.

*Line 191* – Done.

*Line 197-198* – Done. Required a significantly re-organized sentence.

*Line 197 and elsewhere* – Done.

*Line 203* – Done. We also had an error in our back-transformed intercept (used base e instead of base 10). Thus, the back-transformed intercept was not within the intervals provided by FishBase. We have corrected the text to reflect this result.

*Line 205* – Changed “quite” to “highly” rather than just deleting “quite” as suggested by the reviewer. We are trying to communicate that there is high variability here. Just saying “variable” does not communicate that observation.

*Line 215* – Done.

*Lines 227-231* – Fixed. It appears that our intent was not clear with the last sentence in this paragraph. The paragraph is about problems ageing fish with scales and how that is likely related to crowded circuli at the scale margin. The last sentence is mean to provide credence that growth of the fish is slow and thus growth of the scale would be slow and would result in crowded circuli. We have modified the start of the last sentence to more directly tie the rest of the sentence to the concept of crowded circuli and, thus, the topic sentence for the paragraph. We feel that this will address the reviewer’s concern.

*Line 232-239* – We do not feel that this paragraph needs to be augmented per the reviewer’s request. Our intent here is to be as transparent as possible about the problems that we encountered while ageing these fish so that the reader can be cognizant of this while interpreting our results and for planning future studies. We feel like the original paragraph accomplishes this intent.

*Line 260* – Done.

*Line 269* – Done.

*Line 270* – We did not change this. The actual values are in the results and they depend on the age examined. The general statement that we use seems warranted for the discussion.

*Lines 274-276*. Again (please see our response for lines 68-70), we agree with the reviewer’s comment. We have re-written the last sentence primarily by changing the word “change” to “differ” to more clearly articulate that we compared two sampling events. We have attempted to say that these two events do not “differ” and make not implied statements about whether any of the metrics have “changed” in 60 years. In other words, as the reviewer noted, the metrics could have changed without our two data points being different. We think that the “differs” language is more accurate and address this concern.

**Response to Reviewer 2’s Comments**

(Line numbers refer to our original submission … which is the line numbers that this reviewer refers to)

*Line 289* – Fixed, changed “Norway” to “Sweden”.

*Table 3* – Done. We added the state/province information and a note about whether scales or otoliths were used for each study.

*Figure 1* – We added the Eschmeyer and Bailey sampling locations.

**Additional Changes**

Changed “von Bertalanffy growth model” to “von Bertalanffy growth function” and “VBGM” to “VBGF”.

Changed “coefficient of variation” to “average coefficient of variation” and “CV” to “ACV” when referring to precision of age estimates.

Fixed hanging indent for Becker reference.

*Line 188* – Fixed misspelled Eschmeyer.

**References**

Cailliet, G. M., W. D. Smith, H. F. Mollet, and K. J. Goldman. 2006. Age and growth studies of chondrichthyan fishes: the need for consistency in terminology, verification, validation, and growth function fitting. Environmental Biology of Fishes 77:211-228.

Kimura, D. K. 1980. Likelihood methods for the von Bertalanffy growth curve. U. S. Fishery Bulletin 77:765-776

Kimura, D. K. 1990. Testing nonlinear regression parameters under heteroscedastic, normally distributed errors. Biometrics 46:697-708.