

Age and Growth of Pygmy Whitefish, *Prosopium coulterii*, in Lake Superior

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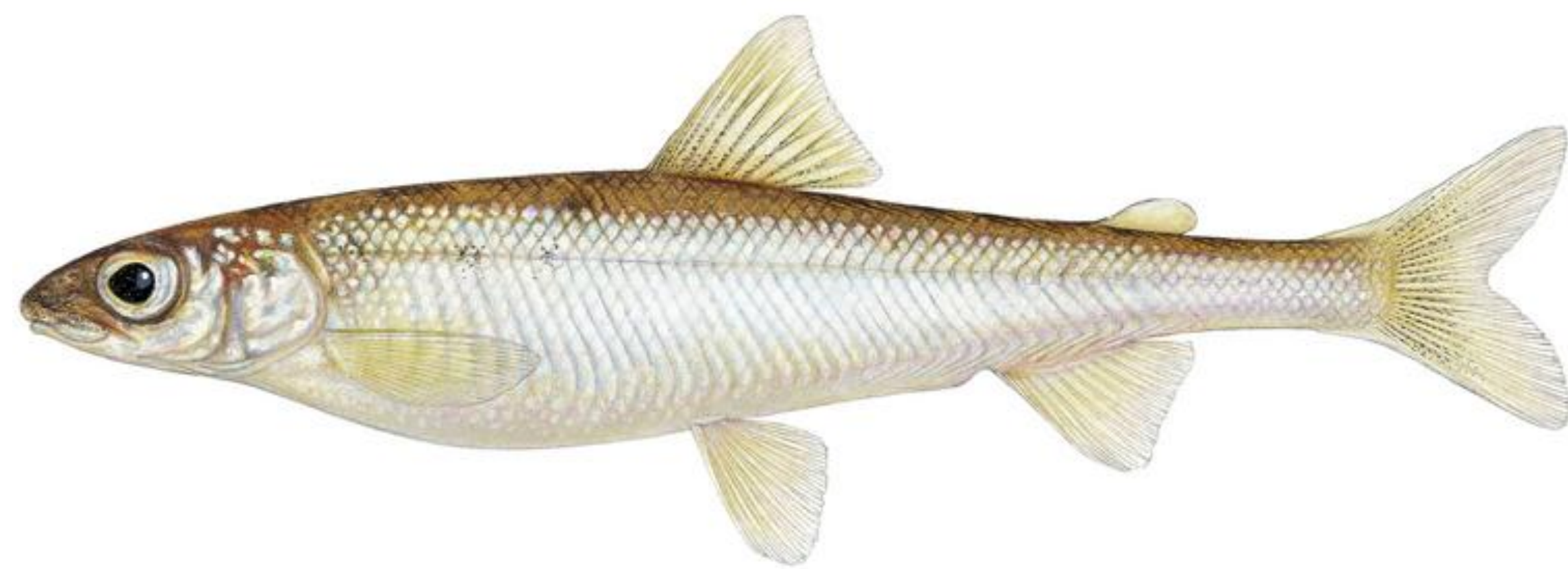
Introduction

- Pygmy Whitefish (PWF; Figure 1) discovered in Lake Superior in 1952, 1500+ km from previously described range on the Pacific Slope
- Eschmeyer and Bailey (1955) described life history from 1953
- No further life history studies of Lake Superior Pygmy Whitefish

Purpose

- Compare ages assessed from scales and otoliths
- Compare age and growth metrics for PWF from 2013 and 1953

Figure 1.
Pygmy
Whitefish



Methods

- PWF sampled with bottom trawls at 26 stations from throughout Lake Superior in May-July 2013
- Total length and sex recorded for all sampled fish
- Scales and sagittal otoliths removed from a subsample of fish
- Age assessed from scales and thin-sectioned otoliths (Figure 2)
- Age-bias assessed with 65 paired otolith and scale ages
- Otolith age-length key applied separately to males and females
- Growth metrics estimated with the Francis version of the Von Bertalanffy growth model applied to 195 ages from males and females

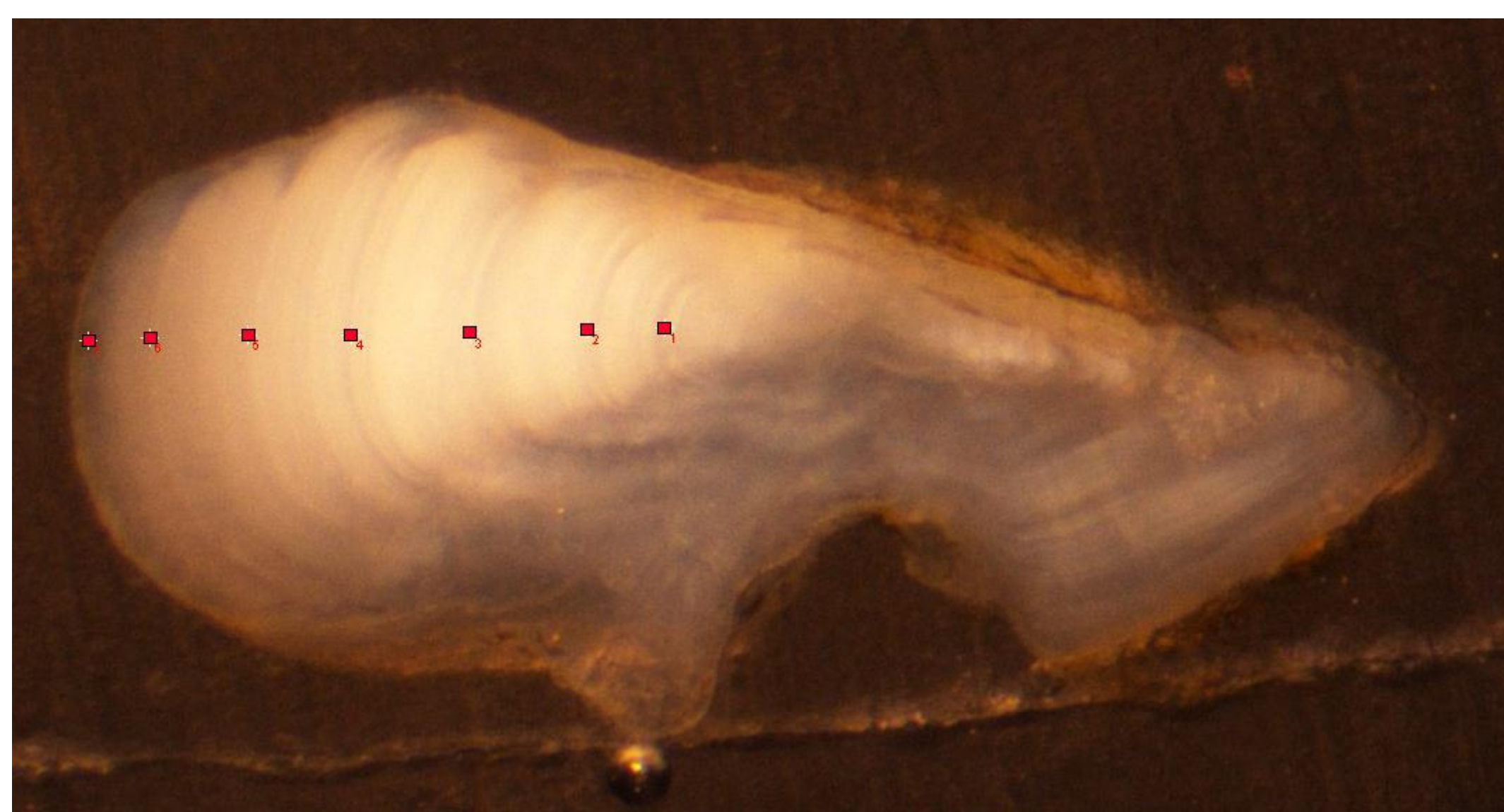


Figure 2. Thin-sectioned otolith of an age-7, 104-mm, male Pygmy Whitefish

Conclusions

- Otolith ages are greater than scale ages after at least age-2
- Otolith ages are difficult to assess and have not been validated
- PWF live longer than previously thought, but longevity probably has not changed since 1953
- Female PWF live longer, grow to a longer maximum length, and are longer after age-3 than males
- Growth metrics likely have not changed since 1953

Results

- Scale and otolith ages differed significantly ($p < 0.001$), with otolith ages significantly greater after age-2 (Figure 3)

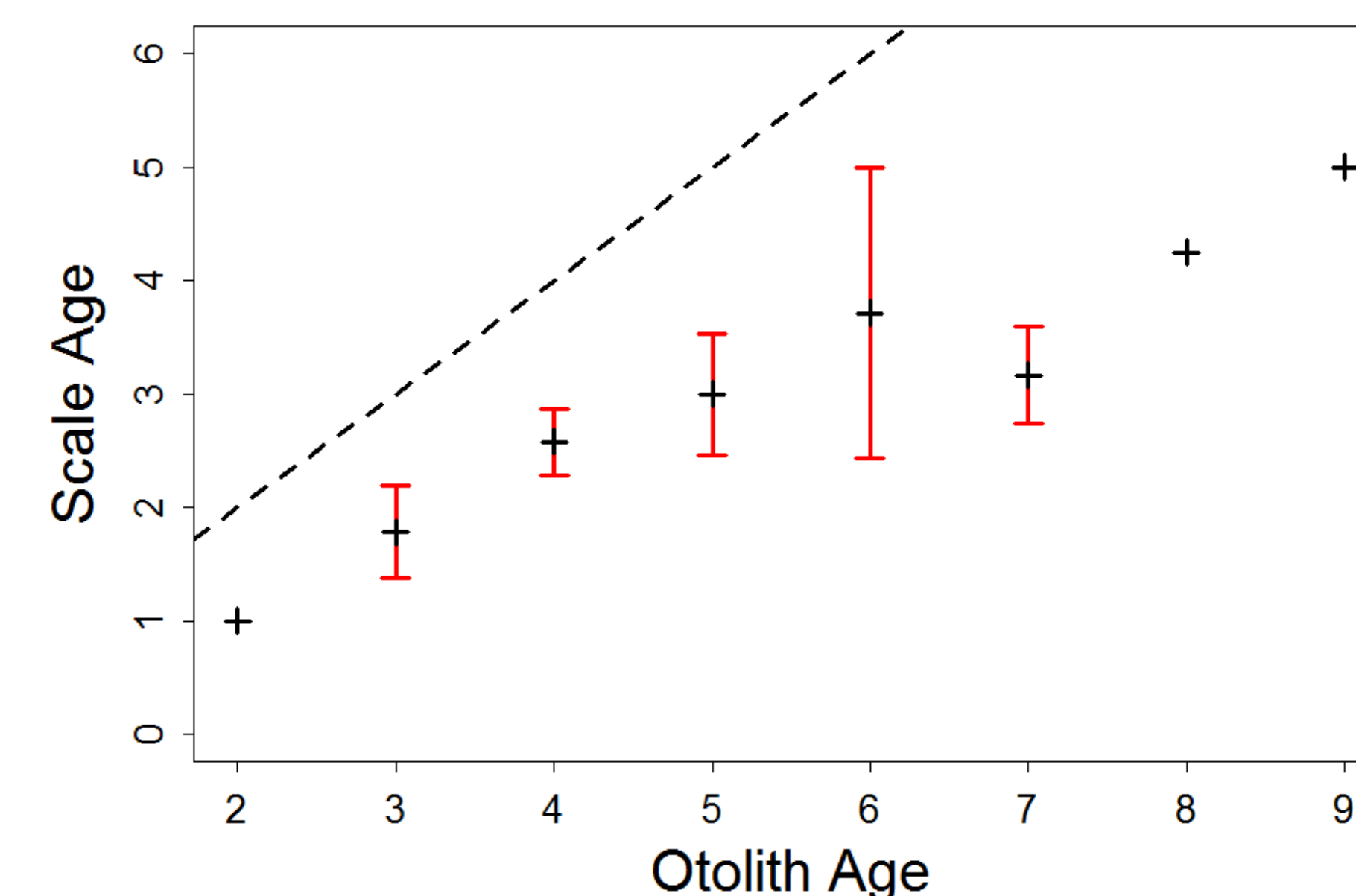


Figure 3. Age-bias plot for otolith and scale ages of Pygmy Whitefish. The diagonal line is the age-agreement line

- Maximum otolith age was 9 for females and 8 for males in 2013, compared to scale ages of 7 for females and 5 for males in 1953
- Mean lengths of males and females in 2013 did not differ at age-3 ($p = 0.680$), but did differ at age-5.5 and 8 (both $p < 0.001$; Figure 4)

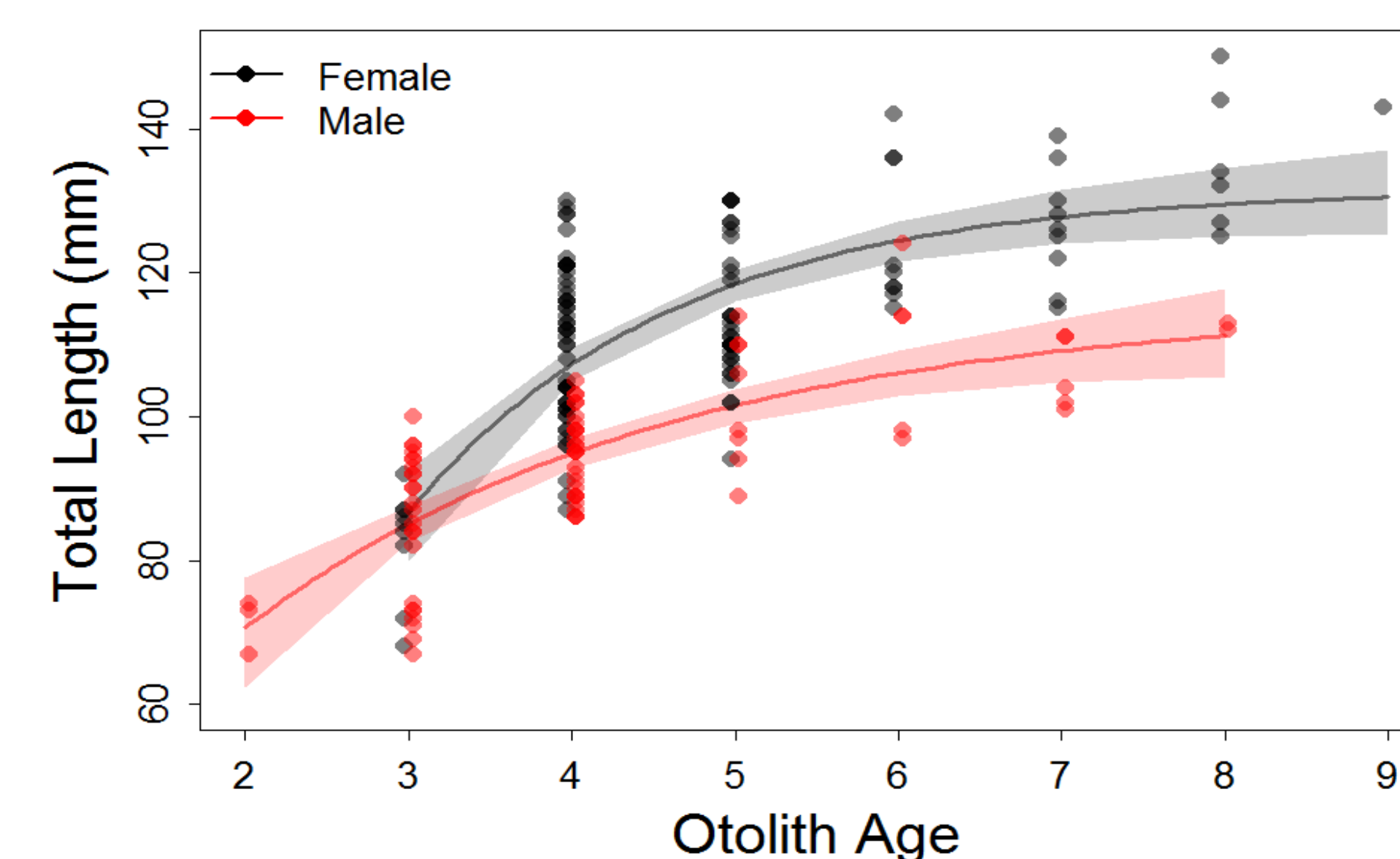


Figure 4. Von Bertalanffy Growth Model fits (with 95% confidence bands) for male and female Pygmy Whitefish