

Estimating size-at-age and growth of Bluemouth

1. INTRODUCTION

The objective of this project was to document the relation between the size and age of bluemouth (*Helicolenus dactylopterus*) which is a marine ray-finned fish found in large parts of the Atlantic Ocean, from Norway to South Africa, in deep waters ranging from 150-600 m [1]. Since 2017 the BIO102 course at the University of Bergen has carried out research cruises at the same stations, off the western coast of Norway collecting demersal fish species. This data has been used to investigate whether the changes in bluemouth size frequency has been gradual over the years or if it is a result of one or more pulses of recruited individuals. The bluemouth samples from the 2021 research cruise were analyzed with respect to age in order to verify whether the length distribution can be used for cohort determination in the various years in which data was collected (Figure 1).

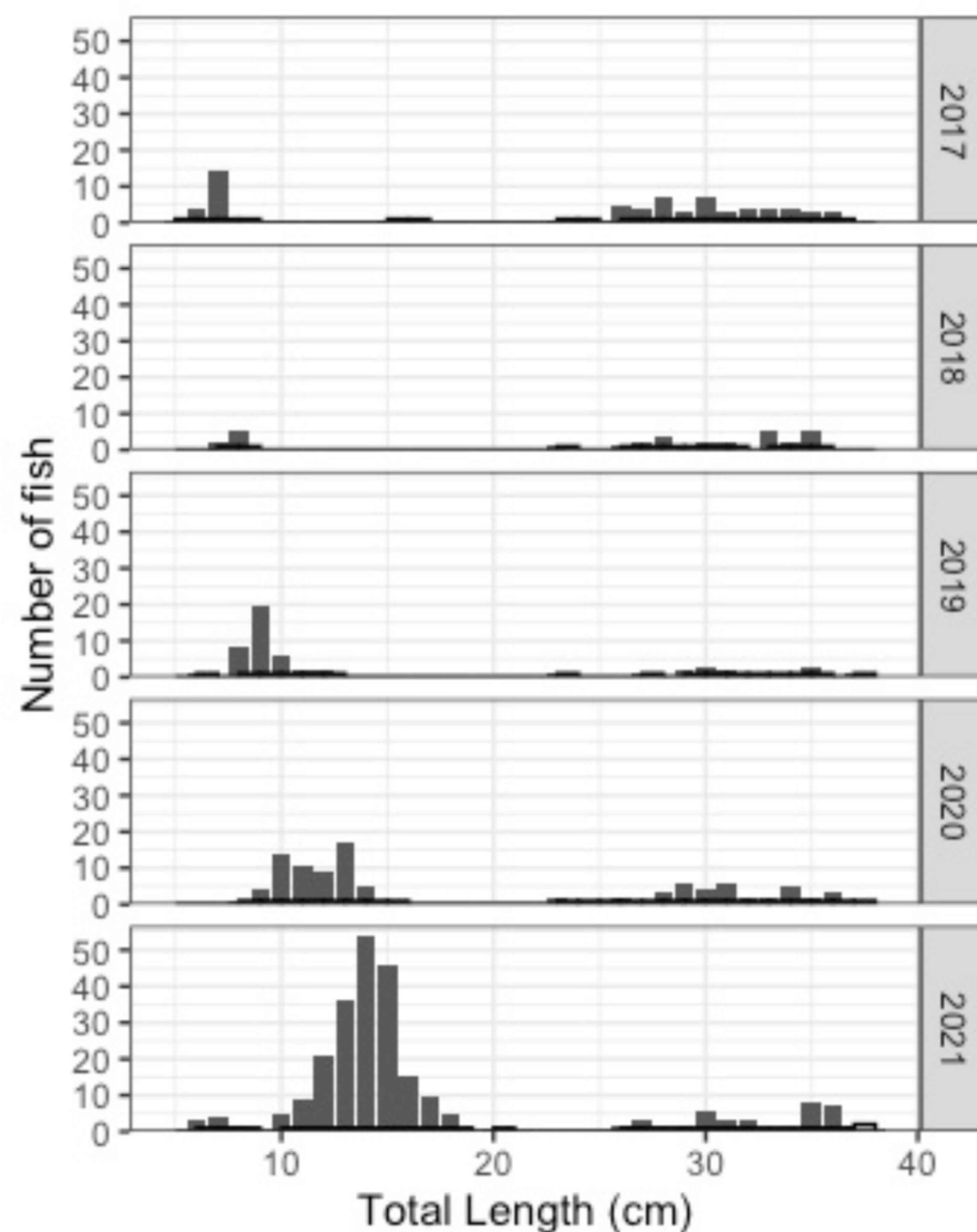


Figure 1: Length frequency distribution of bluemouth from BIO102 cruises.

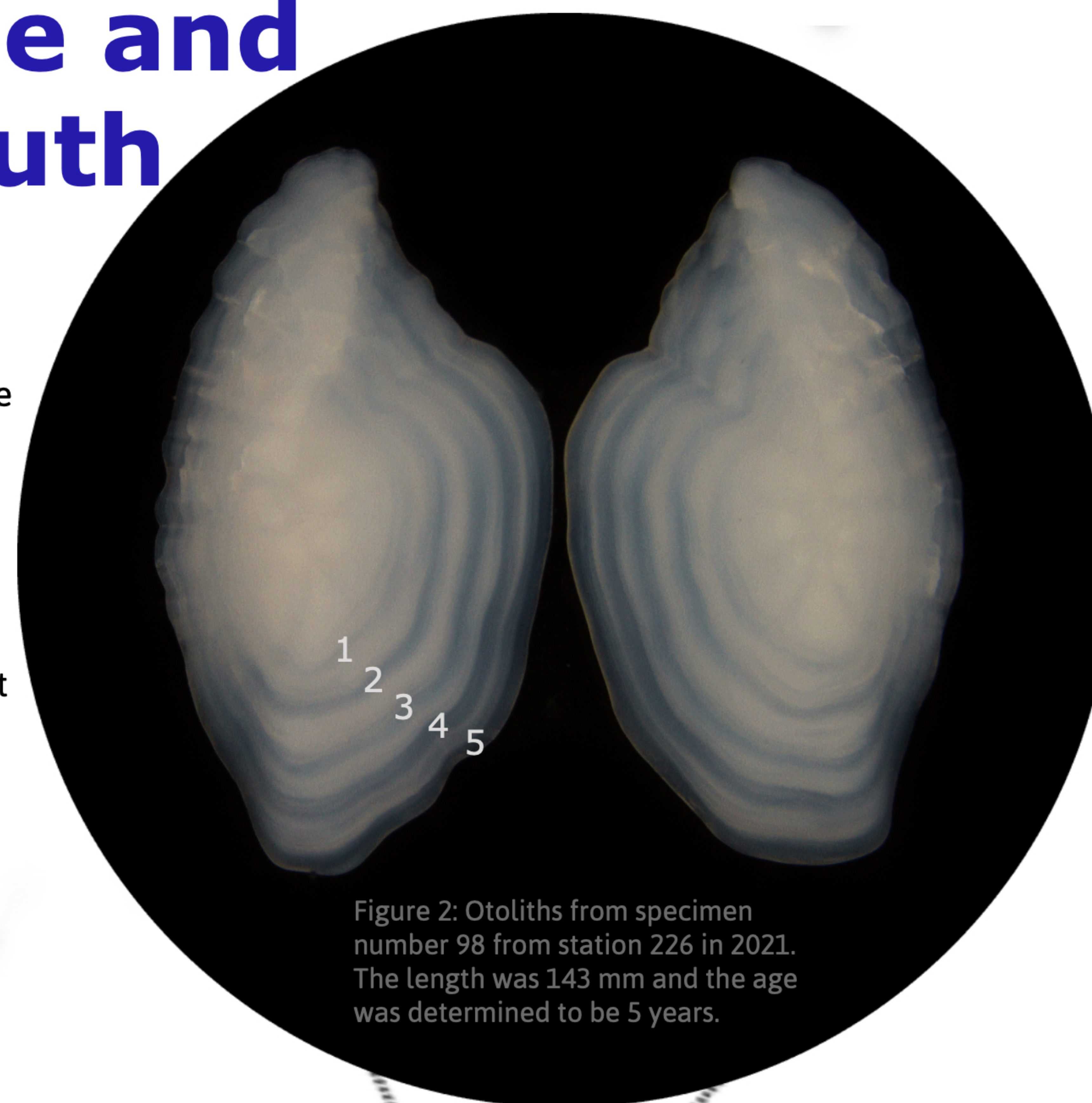


Figure 2: Otoliths from specimen number 98 from station 226 in 2021. The length was 143 mm and the age was determined to be 5 years.



2. MATERIALS AND METHODS

- Material: 238 individuals from the 2021 research cruise
- Data collection per specimen: length and weight measurements, otoliths and sex identification of specimens over 15 cm.
- The age of the individuals was determined by reading the otoliths, where age certainties from 1-4 were assigned with 4 as highest (Figure 2)
- The 173 individuals which had an age certainty of 2 or higher are shown in Figure 3.
- Data visualization using R

3. RESULTS AND DISCUSSION

The growth parameters obtained from the size-at-age calculations, seen in Figure 3, indicated an average growth rate of 23 mm per year between the ages of 2 and 5. This is in line with the age estimate of the 300mm fish being 10 years or older. The growth rate and size-at-age estimate is slightly lower than findings in similar studies [2, 3]. However, the individuals used in this study are living in the northerly part of the species range, so a lower growth rate is expected.

This size-at-age estimate supports a hypothesis where an older group of bluemouth were recruited into this area and gave birth to a relatively large cohort in 2015. When this cohort was first recorded in 2017 the average length was 6.2 cm and an age of 2 years, and it grew slowly larger to a length of 13.5 cm in 2021.

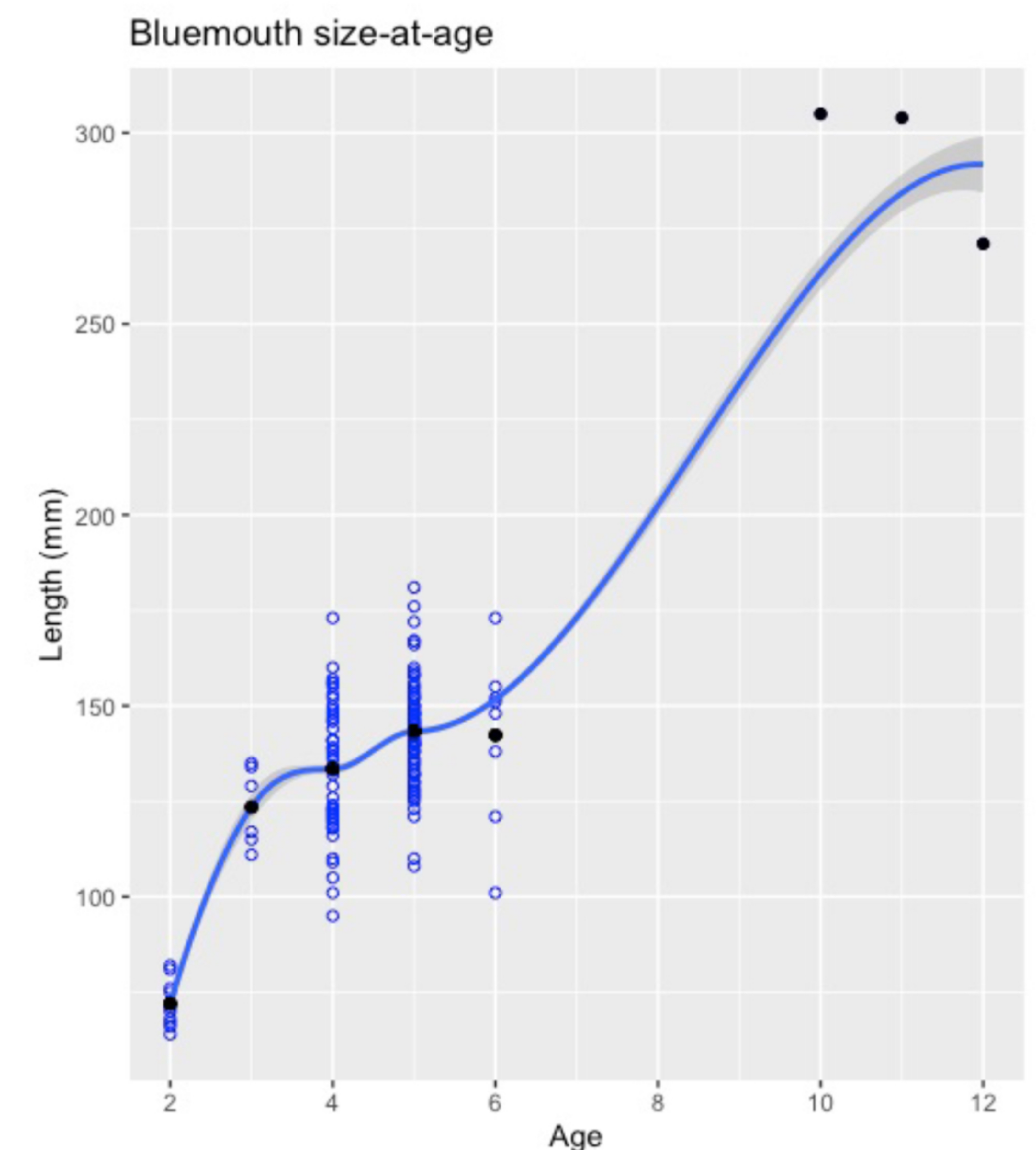


Figure 3: Estimated size-at-age of bluemouth with the age certainty of 2 or higher. Smoothed line added for visual clarity.

References:

- [1] FishBase. 2021. *Helicolenus dactylopterus*. [online] Available at: [Accessed 11 November 2021].
- [2] Abecasis, D., Costa, A., Pereira, J. and Pinho, M., 2006. Age and growth of bluemouth, *Helicolenus dactylopterus* (Delaroche, 1809) from the Azores. Fisheries Research, 79(1-2):148-154.
- [3] Massuti E, Morales-Nin B, Moranta J (2000) Age and growth of blue-mouth, *Helicolenus dactylopterus* (Osteichthyes: Scorpaenidae), in the western Mediterranean. Fisheries Research 46:165-176.



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