Fisheries & Conservation Science

SCIENCE UPDATE

Bass & Rays: December 2014

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Sea bass – *Dicentrarchus labrax*

Preliminary results

Growth and maturity

We have collected data on 2400 bass caught in Welsh waters. We are currently analysing the life history parameters (factors such as growth and size at first maturity which are important for fisheries management) of these bass. Using the Von Bertalanffy growth equation (a growth model) we are able to find the growth rate and L infinite or asymptotic length (the length a fish would reach if it could grow indefinitely) of the bass (Figure 1). Looking at the male and female fish together (combined-sex) the values of the asymptotic length (L inf) and the growth rate (K) are very similar to those estimated in the last stock assessment (ICES WGCSE REPORT 2013) for all UK areas (L inf=84.55 and K=0.09).

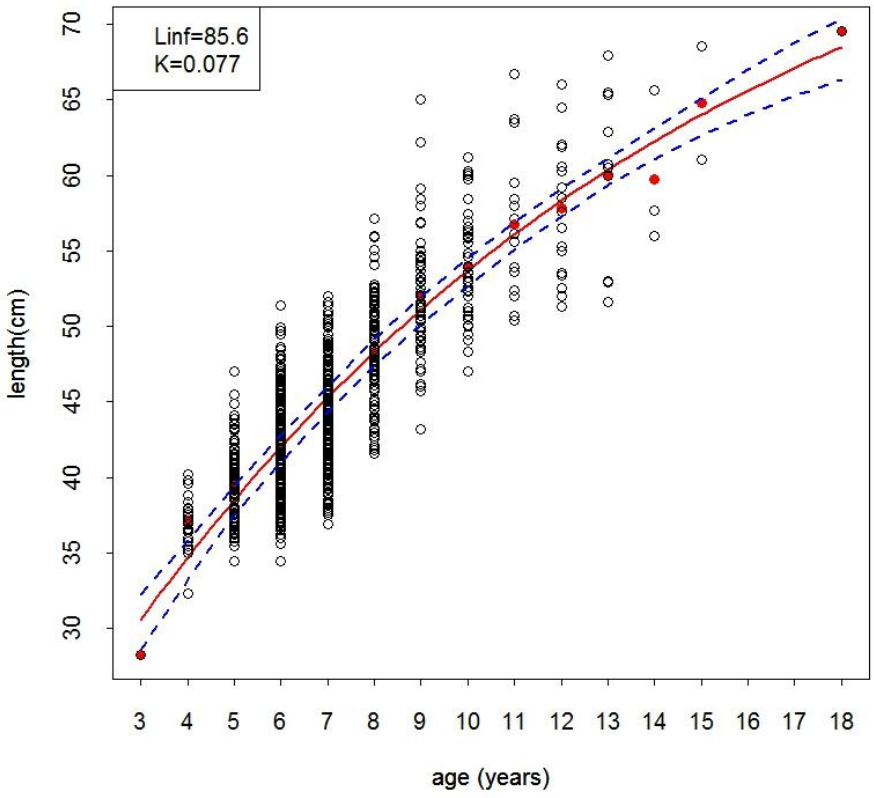

Figure 1. Von Bertalanffy growth curve for the combined-sex of bass caught around Welsh waters.

Maturity stage for males (Figure 2) and females (Figure 3) are consistent with the Gonad somatic index (GSI) (Figure 4). This calculates the mass of the gonad as a proportion of the total body mass and is a tool for measuring the sexual maturity of the bass. The results clearly show that the spawning period is between January and June.

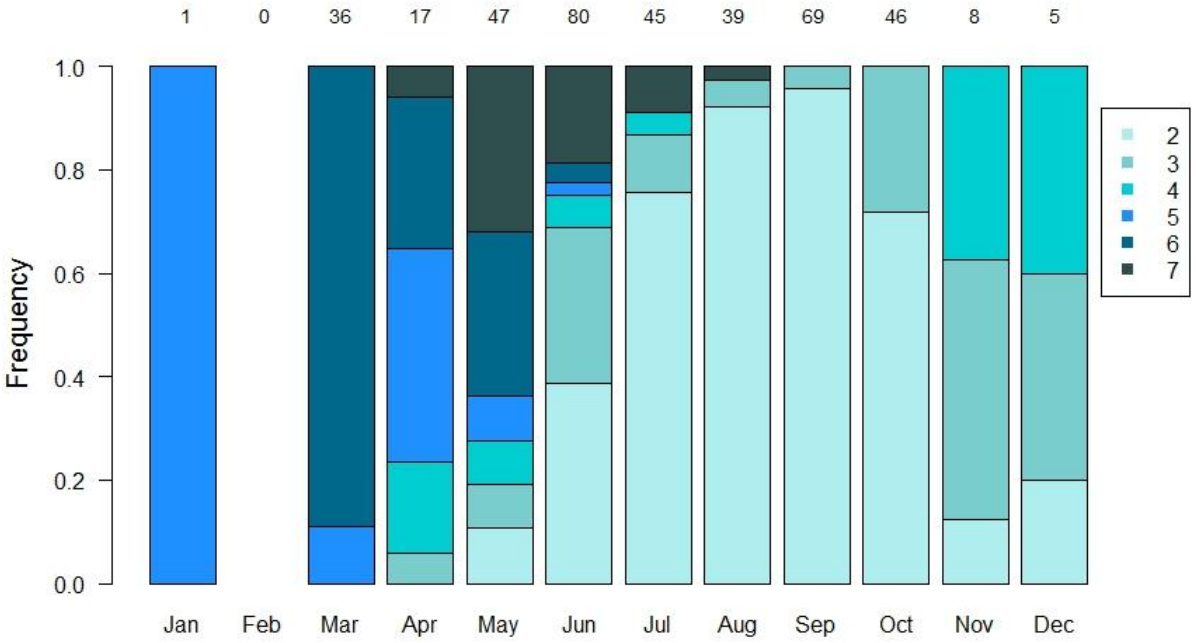

Figure 2. Proportion at each maturity stage by month for the male bass caught during 2013 and 2014 (Stage 2: recovering spent, stage 3: developing (early); stage 4: developing (late); stage 5: ripe; stage 6: running; stage 7: spent)

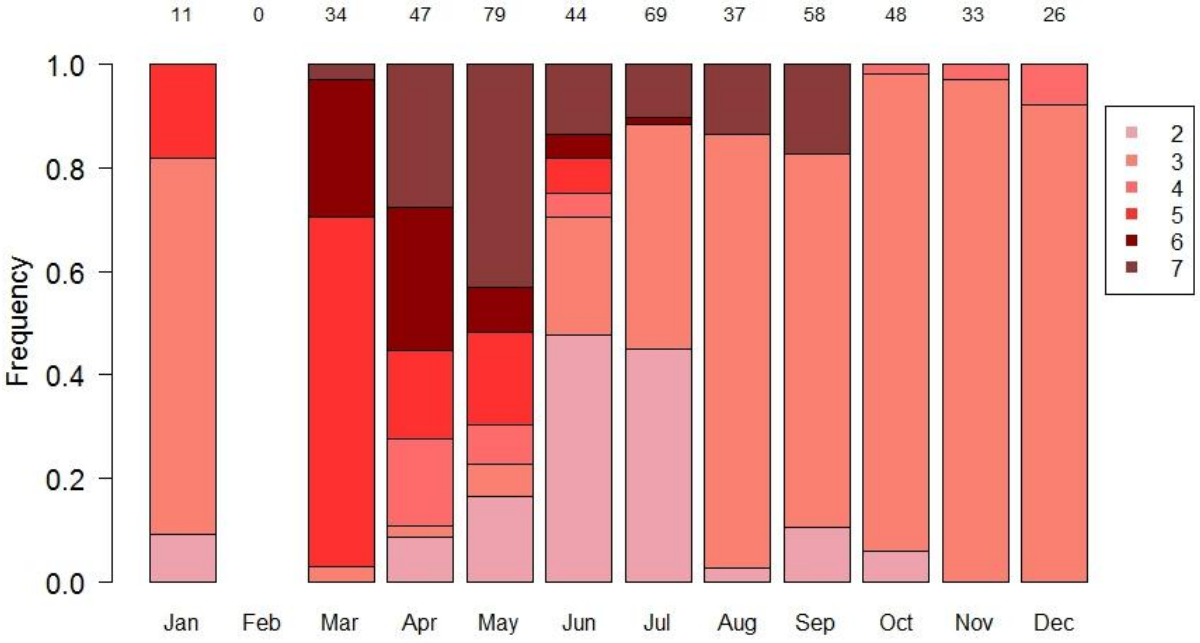

Figure 3. Proportion of the maturity stage by month for the female bass caught during 2013 and 2014 (Stage 2: recovering spent, stage 3: developing (early); stage 4: developing (late); stage 5: ripe; stage 6: running; stage 7: spent)

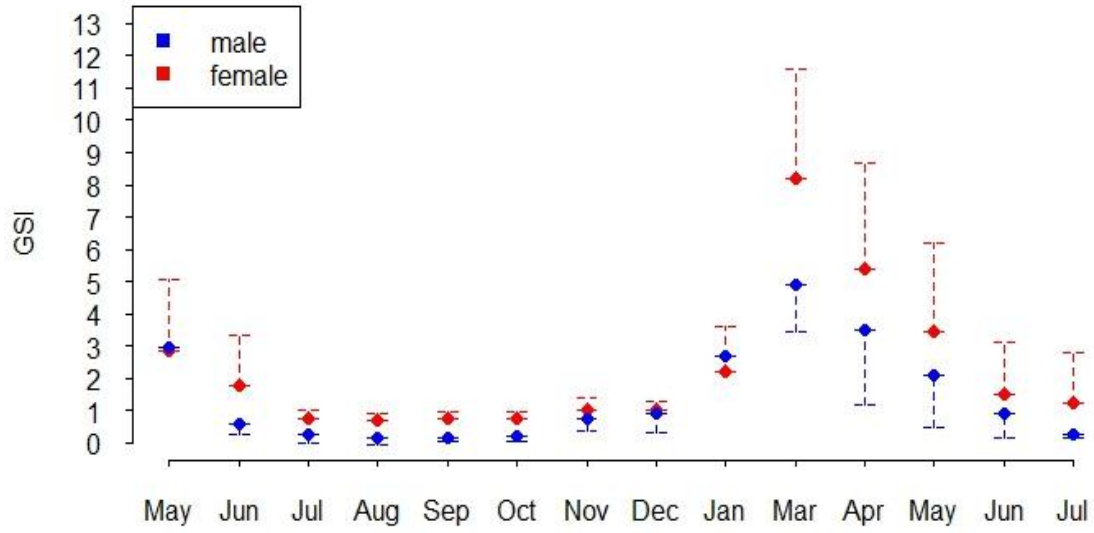

Figure 4. Gonad Somatic Index (GSI) by month expressed as the weight of the gonads as a proportion (in %) of the total weight for male and female bass.

Stable isotopes

The analysis of the last growing season of bass scales for δ15N and δ13C signatures reveals a high degree of separation between bass caught in South Wales and bass caught in Mid and North Wales (Figure 5). This suggests the presence of 2 separate populations and thus 2 possible management units.

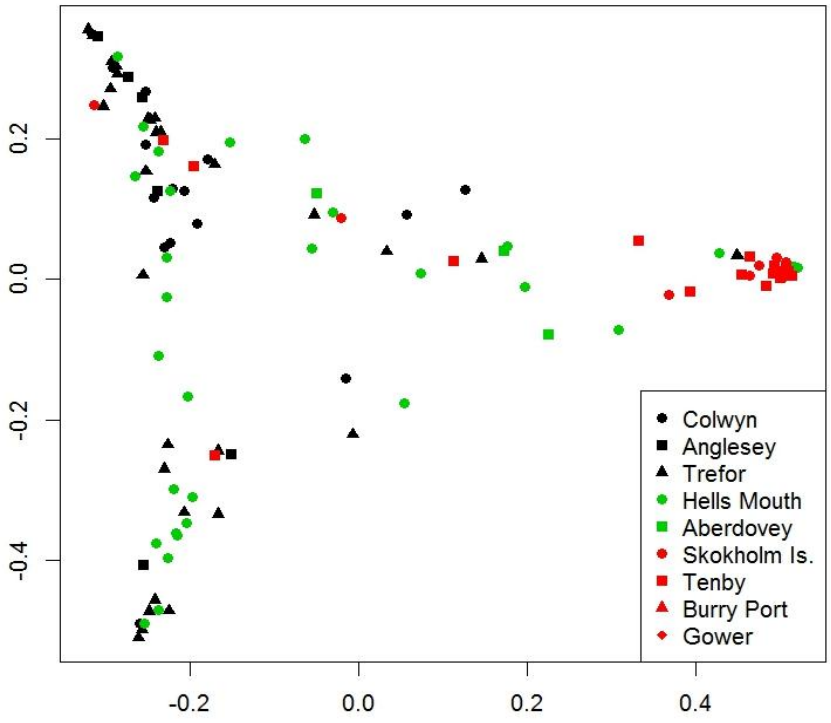

Figure 5. Level of separation between bass from South Wales (red points) and bass from Mid and North Wales (green and black points).

Thornback ray – *Raja clavata*

We have analysed 88 thornback rays (Figure 6) from North Wales (Conwy Bay and Red Wharf Bay).

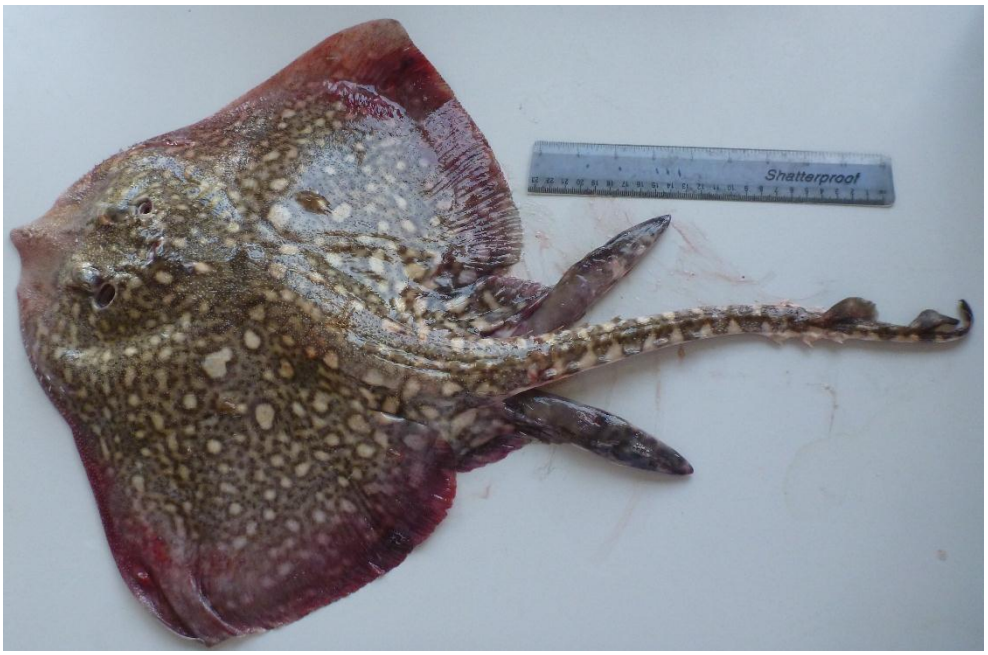

Figure 6. Thornback ray caught in Conwy Bay

The age of each fish was determined from the number of opaque and hyaline bands deposited on the vertebral centra, after being stained with alizarin red S (Figure 7).

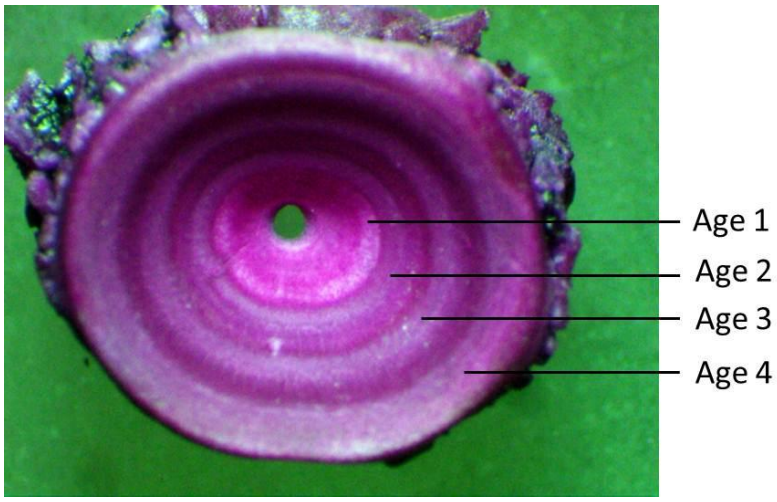

Figure 7. Example of vertebral centra of a Thornback ray with opaque and hyaline bands.

The results showed that male thornback ray reach 50% maturity at 62.5 cm and 3.8 years old (Figure 8) compared with previous studies where they were 58.5cm and 3.9 years old. Female thornback ray

reach 50% maturity at 71.5 cm and 4.3 years old (Figure 9) compared with previous studies where they were 70.5 cm and 5.3 years old (North Wales in 2003-Whittamore and McCarthy, 2005).

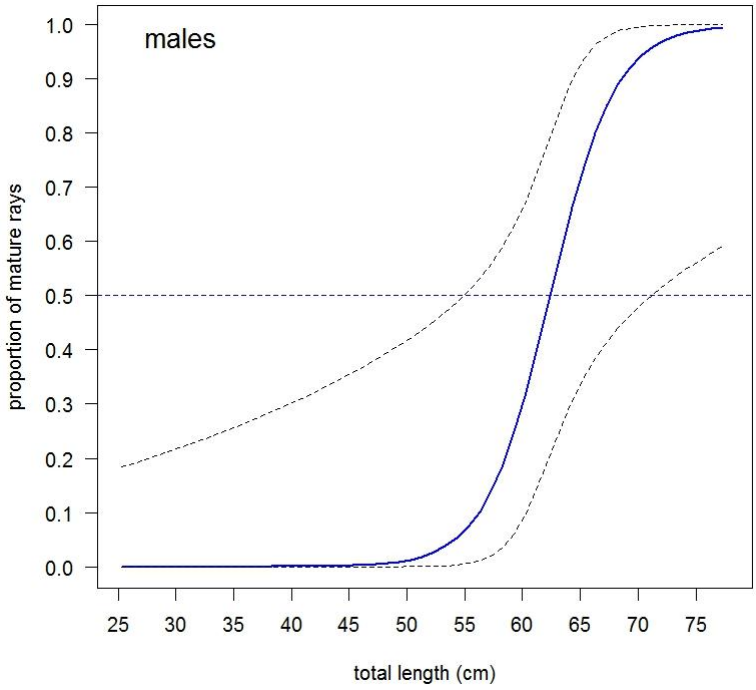

Figure 8. Size at maturity for males of thornback ray.

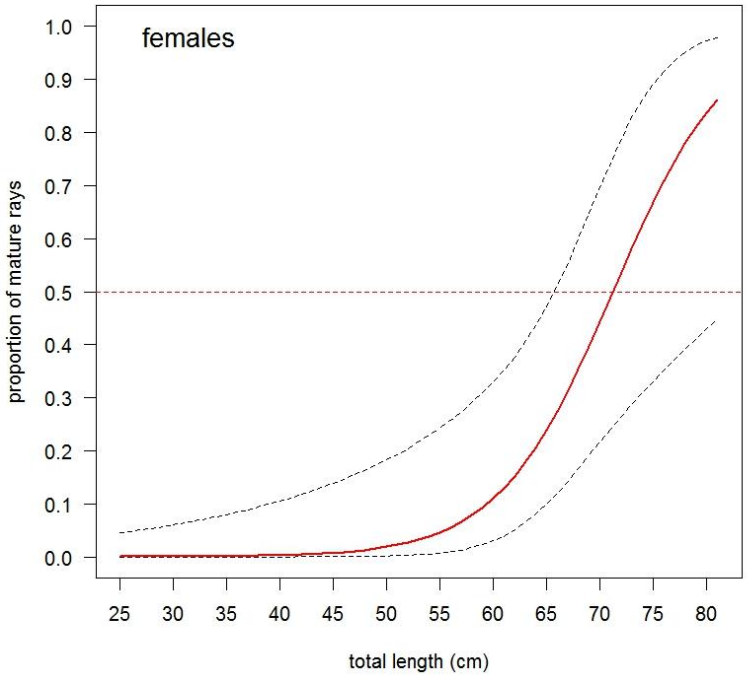

Figure 9. Size at maturity for females of thornback ray.