

Assessment of queen scallop (*Aequipecten opercularis*) in a north-west fjord (“Djúpini”) of the Faroe Islands 2013

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1. Introduction

The following assessment is based on a research survey carried out by the scallop fishing vessel M/S Norðheim.

The dominant cohabitants in the main habitat of the scallop are different species of whelks, mussels, starfishes, brittlestars, prawns, sea urchins, sea anemones, hydroids, bristle worms and hermit crabs.

2. Material and methods

The methodology in the present assessment is similar to that used for the assessment of the northern component of the queen scallop (Assessment of queen scallop (*Aequipecten opercularis*) in the Faroe Islands 2013, report).

A swept-area biomass is calculated based on 8 hauls recorded by the Faroese scallop vessel Norðheim in January 2013. (Figure 2.1).

The area was divided in 9 equal-sized squares of 3.20 km² each (1.723 km longitude, 1.855 km latitude) covering a total area of 29 km² (Figure 2.2). Due to logistic issues one station (nr. 8) was discarded and not taken into account in the analysis. The scallop beds are situated in a north-west south-east axis in depths of 90-145

m

Every square was towed once with a double 12-foot dredge (7.3 m). Towing time was set to 10 minutes and the average towing speed 4.8 knots (8.8 km/h). Catch was recorded in every haul and a random sample of 10 scallops taken for further biological measurements.

Density is calculated by dividing catches by the swept area:

$$\text{Density (kg/km}^2\text{)} = \text{Catch (kg)} / \text{Area Swept (km}^2\text{)}$$

Swept area is calculated as:

$$\text{Swept Area (km}^2\text{)} = \text{towing time (hr)} \times \text{towing speed (km/hr)} \times \text{width of trawl (km)}$$

Biomass is calculated as area of square times density:

$$\text{Biomass (t)} = \text{Area square (km}^2\text{)} \times \text{Density (kg/km}^2\text{)} \times 1000$$

3. Results

Geographical distributions of catch, density and biomass are shown in figures 3.1, 3.2 and 3.3 respectively. The graphs clearly display concentrations of scallops in the northern sea-beds whereas the southern waters show almost a complete lack thereof.

A total catch of 3.8 tons was landed with a mean density of 52 t/ km² over the entire survey area.

Average catch is 0.5 tons (std. Error = 0.120 t.) while mean density is estimated at 52.2 t/ km² (std. Error = 19.3 t/km²)

The estimated total biomass of queen scallop in the area is 1 336 tons with an average of 167 t (std. Error = 61.98 t). Following the same management plan implemented in the northern area fishery and based on precautionary-approach principles (20% of total stock) a quota not larger than 267 tons would be reasonable estimate for the sustainable harvest of stock.

The stock consists mostly of scallops aged 2,4 and 5 years old (Figure 3.4) comprising 67% of the total age composition. There is a large overlapping in the length distribution of scallops aged 3 and older (Figure 3.5).

Figures 3.5 and 3.6 display several relations between some of the biological measurements taken on the scallop samples. Wet weight relates exponentially ($W = aL^b$) with scallop shell length (Figure 3.5). The average weight of a 60 mm. scallop is 27 gr. and it can reach up to 43 gr. at a 70 mm length.

It is clear when looking at age-disaggregated shell-length, -width and -thickness distributions that large variability is present in 2-year old scallops compared to older individuals (Figures 3.6.a, 3.6.b, 3.6.c)(This may be an effect of that spawning occurs twice a year in Feb. and Aug.) Asymptotic shell-length and -width is 74 and 80 mm respectively while shell-thickness is estimated at 23 mm. Soft body weight of 4-year and older scallops is limited to the 15-20 gr. interval (Figure 3.6.h).

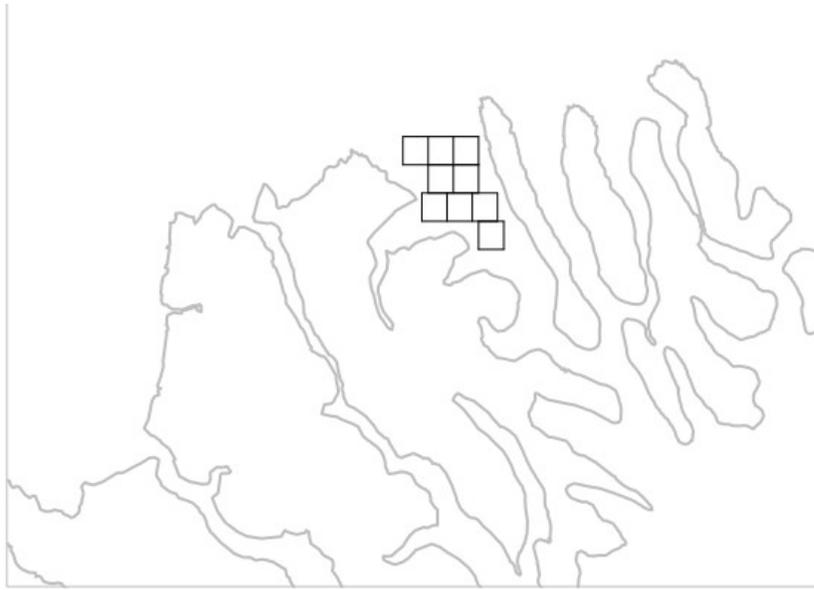


Figure 2.1. Location of the survey area.

Figure 2.2. Geographical representation of the survey area. Station 8 was discarded .

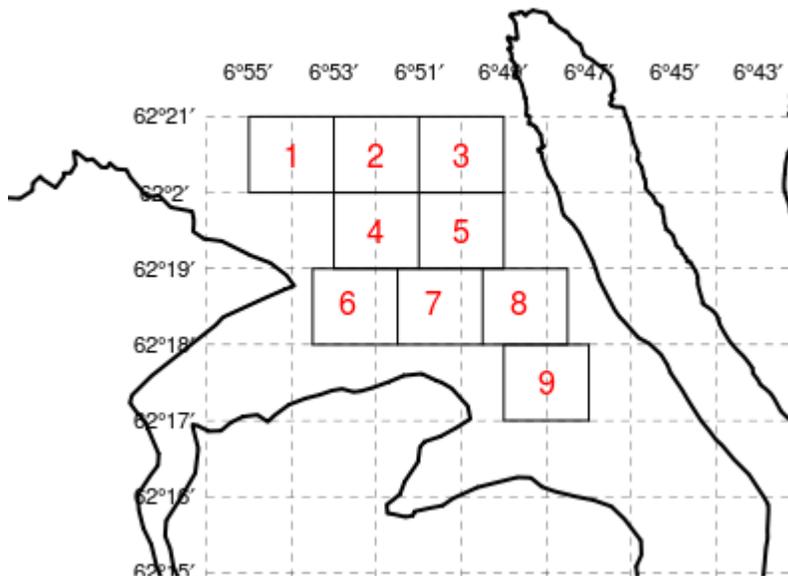


Figure 3.1. Queen scallop. Catches (kg)

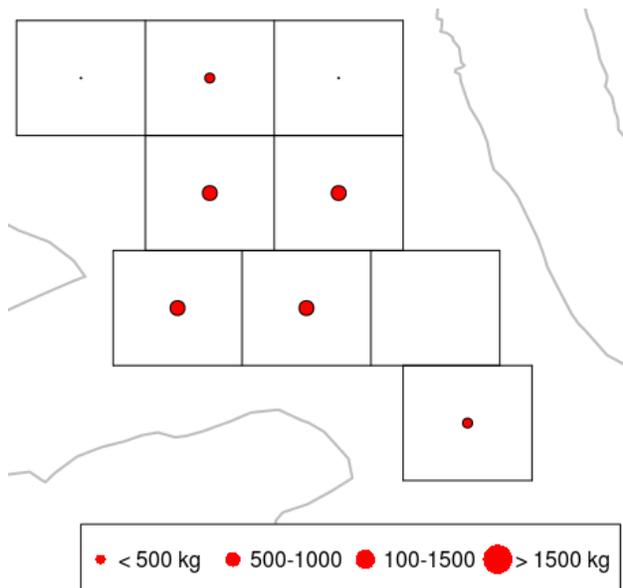


Figure 3.2. Queen scallop. Density estimates (t/km^2)

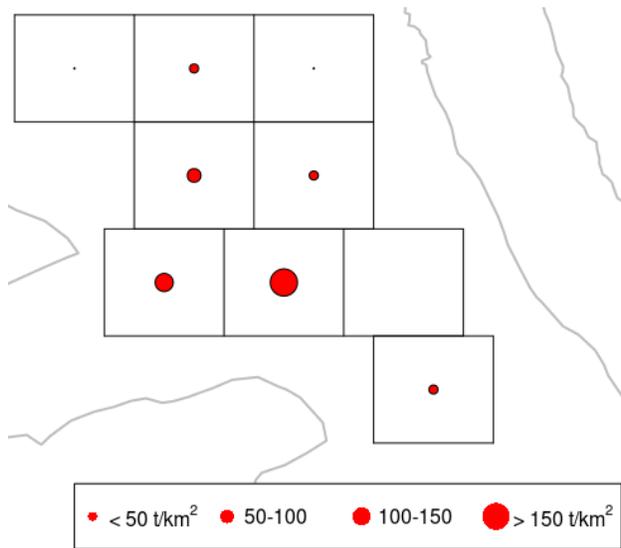
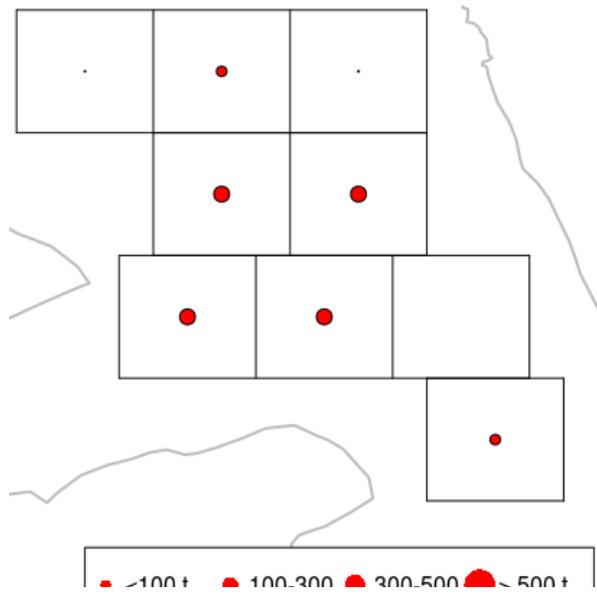


Figure 3.3. Queen scallop. Biomass estimates (tons)



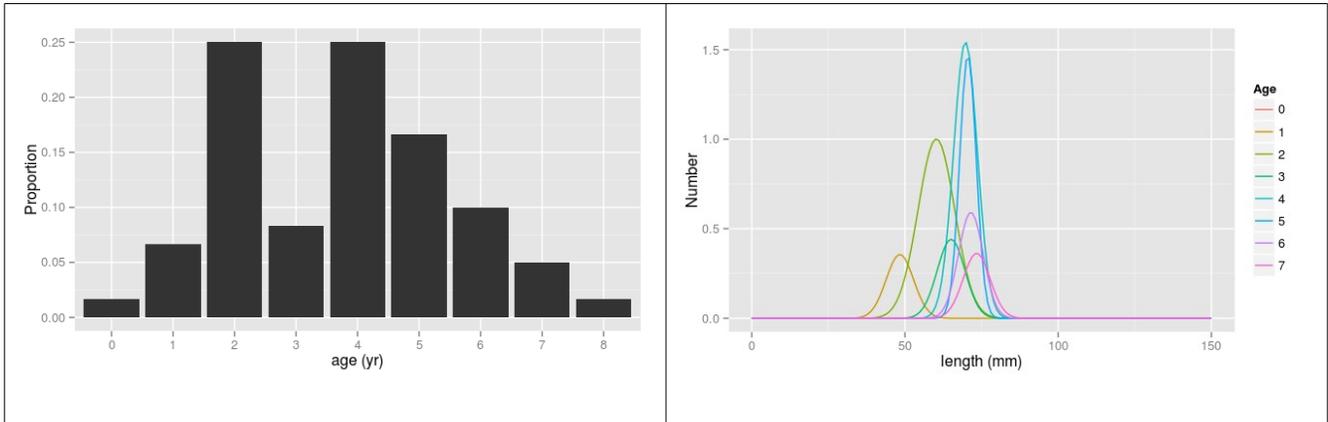


Figure 3.4. Queen scallop. Age composition (left-figure) and age-length relationship (right-figure)

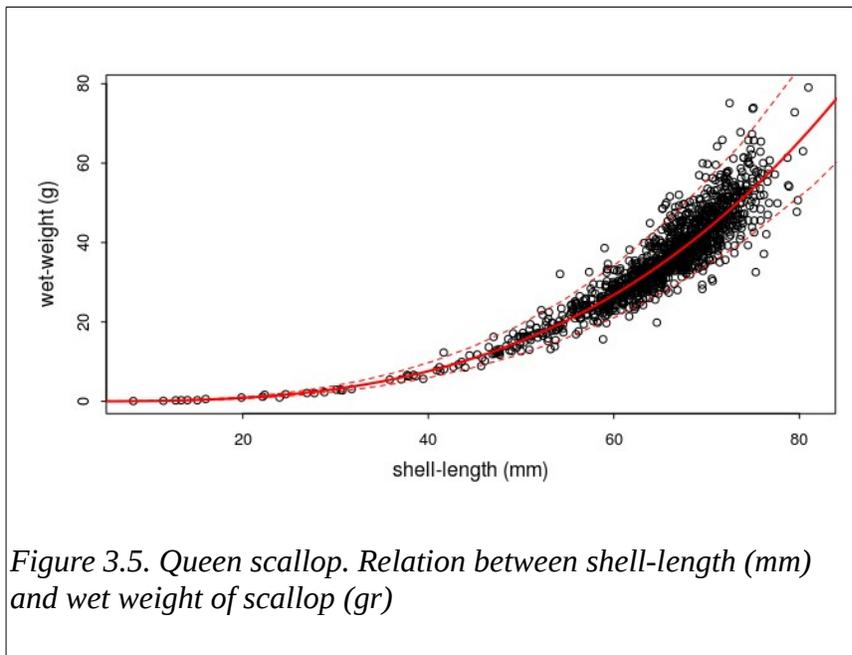
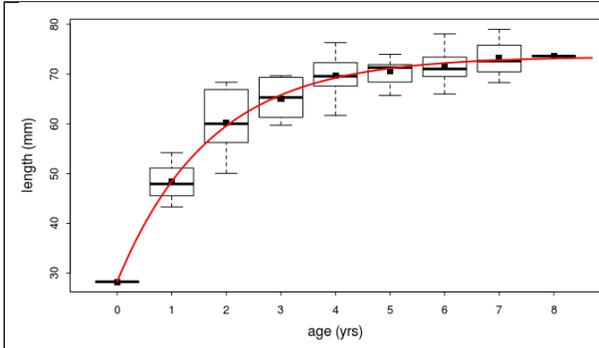
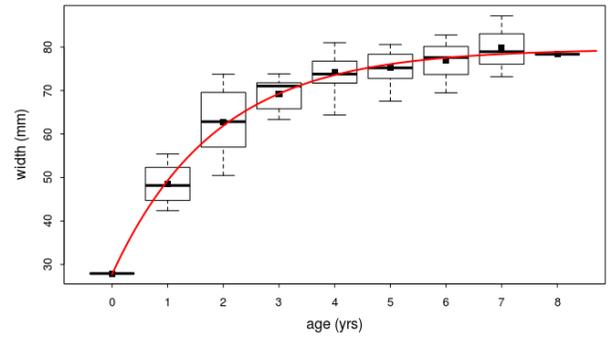


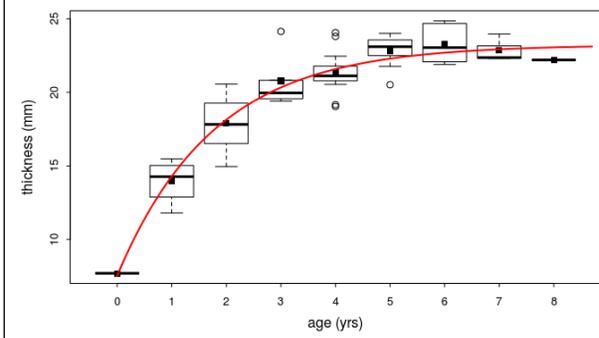
Figure 3.5. Queen scallop. Relation between shell-length (mm) and wet weight of scallop (gr)



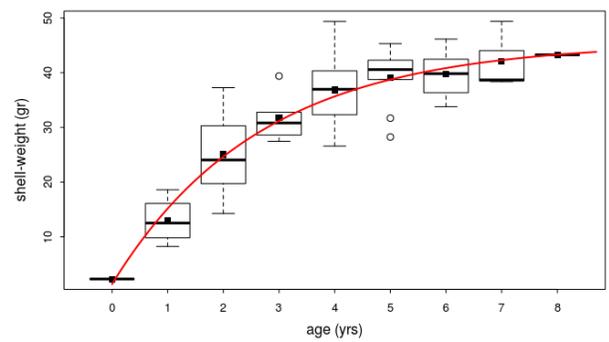
(a) Age (yr)- shell-length (mm)



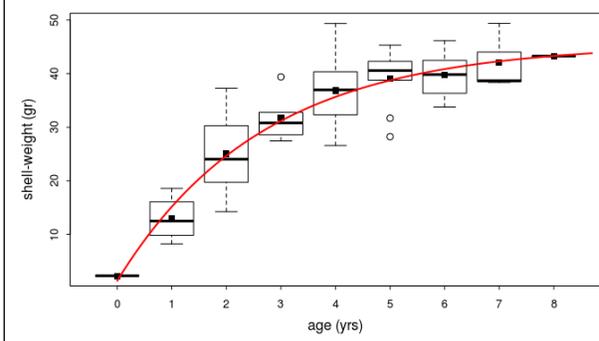
(b) Age (yr)- shell-width (mm)



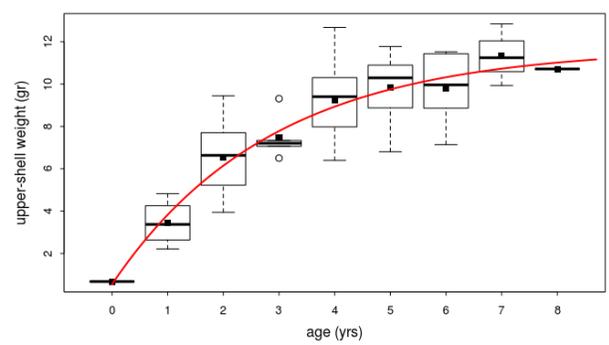
(c) Age (yr)- shell-thickness (mm)



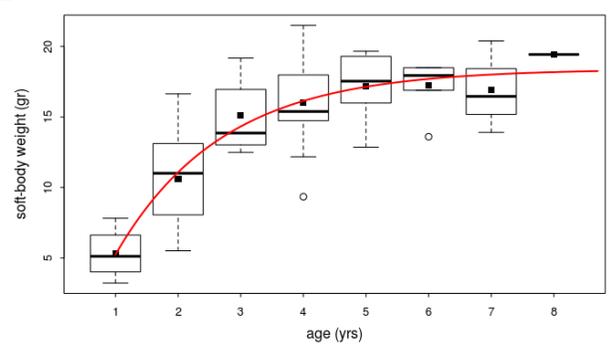
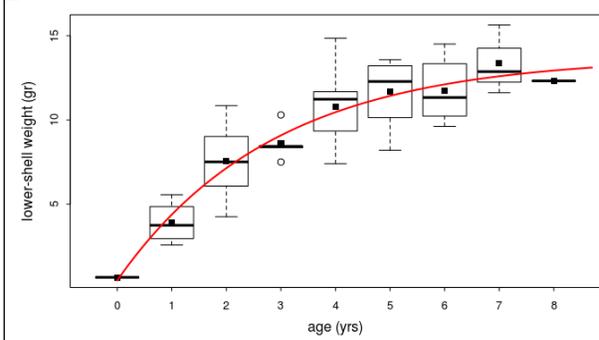
(d) Age (yr)- weight scallop (g)



(e) Age (yr)- shell-weight (g)



(f) Age (yr)- upper-shell weight (g)



(g) Age (yr)- lower-shell weight (g)	(h) Age (yr)- soft body weight (g)
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Figure 3.6. Queen scallop. Relation between age (years) and shell-length (mm)(a), shell-width (mm.)(b), shell-thickness (mm)(c), scallop weight (gr)(d), shell-weight (gr)(e), upper-shell weight (gr)(f), lower-shell weight (gr)(g), soft body weight (gr)(h).