



Fisheries & Conservation Science

SCIENCE UPDATE

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Common Whelk (*Buccinum undatum*)



Background

Whelks are slow growing animals with limited potential for movement, they have direct development and are thought to have low (per individual) recruitment. Their life history strategies make them vulnerable to over fishing and populations may require long recovery times from overfishing.

Currently MLS is set at 45mm. Whelks in southern populations are known to mature at sizes greater than this (French, 2012). Currently there is no closed season for Whelk fishing. Females lay their eggs over winter (from November to January), this is also when some whelk fishers turn to scallop fishing. The EFF “fishers knowledge” interview will help us understand this relationship somewhat. Spatial variability in whelk abundance, size structure or sex ratio is not well documented. Environmental drivers for whelk abundance are not well understood.

Research Aims

1. Catch statistics (size frequency, by-catch)
2. Size at maturity
3. Environmental influences on catch abundance
4. Age structure of population
5. Regional estimates of abundance

Methods

For most research aims, the method is to fish 2 scientific pots in various locations around Wales. Currently 4 pots are fished in Swansea, 2 in Fishguard, 2 off the Llyn Peninsula and 2 off Anglesey.

The animals are weighed and measured, and are removed from their shell and their gonads are assessed for maturity. The shell, foot and operculum are kept for aging.

Understanding the age of the population fished is important for appropriate management of the stocks. The operculum shows growth rings and these are often used to determine age. The operculum aging method is unreliable as physical damage can cause a whelk to lose the operculum and will regrow it (hence only showing the growth rings since it was lost). There is a small statolith (a hard bony structure about 1mm in size) inside the foot of the whelk which also contains growth rings

and cannot be lost during the life of a whelk. We will compare the statolith growth rings to the operculum growth rings and determine a damage index from the shells. This comparative method will determine if aging from just the external structures is appropriate for whelk populations.

The regional estimates of abundance are additional work on whelks, not planned for under the initial EFF project proposals. To have this extra project done we have put it up as an MSc project for the summer of 2014. This project is only possible if students choose this topic to research. We will know in early January if we have a student to undertake this work. The method will be a mark-recapture and depletion experiment in 3-4 locations around Wales. It will require close collaboration with both fishers and MSc students.

Progress

2807 whelks have been processed and assessed for maturity stage. Shells, operculum and feet are in freezer storage until aging can be undertaken (either as a MSc project in Summer or by the EFF team in the Autumn of 2014).

Four methods of tagging are currently being used for *B. undatum* but few retention studies were available in the literature. Here we present the results from four tagging methods currently being used for marine gastropods.

Interesting results

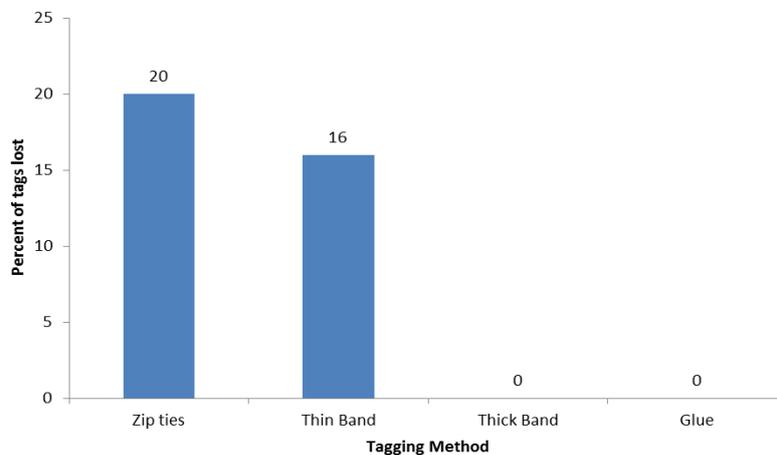


Figure 1. Percent loss of four different tag types on whelks held in an aquarium over two months (October and November 2013). Here we see that thick bands and glue were 100% retained and are a better option in tagging studies when compared to zip ties or thin elastic bands. These methods will be used to determine abundance estimates.

We have some preliminary results from the 2000+ whelks that have been processed so far. We have size at maturity and other catch statistics. We are also assessing the structure of catches from different regions. These will be publicly available after extensive consultation with the fishers involved in this whelk project.

Future

There may be some cases for regional variation in whelk maturity; we are currently investigating this possibility. We are revisiting all of the whelk shells we have in storage and measuring the thickness as there is some suspicion that two morphological varieties exist: a thick-shelled and a thin-shelled morph. The hypothesis is that the thick shelled morph may remain smaller and mature at a smaller size than the larger thin shelled morph. We will soon begin measuring shells and a full report on the data to date will be available early next year after consultation with industry members. Whelk sampling will conclude in July 2014 and a final write up and report on the fisheries samples will be available after this.