

AGE ESTIMATION IN FISH

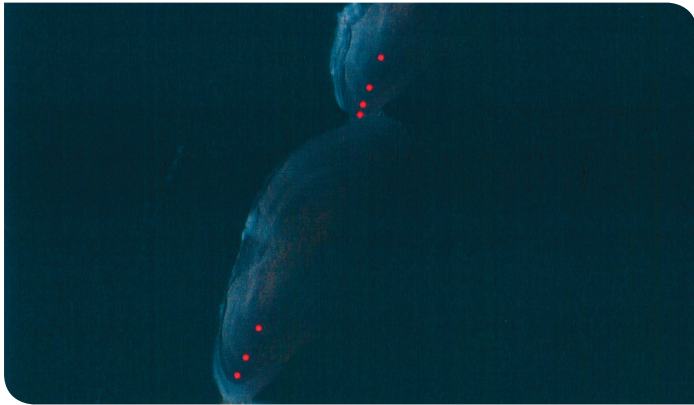


IMAGE OF BROKEN HADDOCK OTOLITHS WITH ANNULI (AGE RINGS) MARKED IN RED

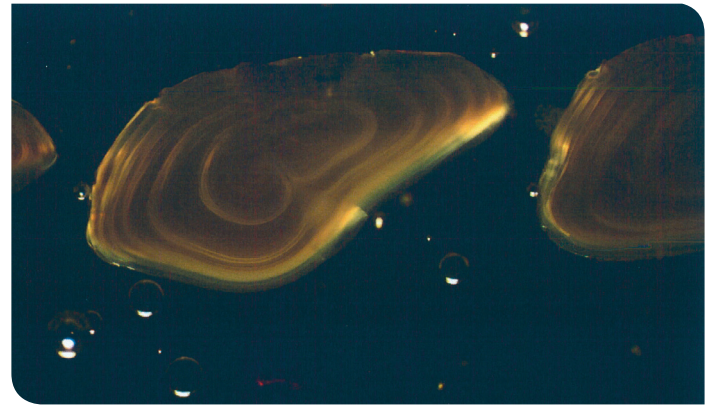


IMAGE OF AN OTOLITHS SECTION FROM A 6 YEAR OLD HADDOCK

Why do we age fish?

The most popular way of age estimation in fish involves the use of hard body parts, such as scales, fin rays, spines, opercular bones and otoliths (ear bones). It relies on the existence of regular, periodic growth markings to which a regular timescale can be assigned, a bit like counting rings on a tree trunk.

Age estimation is a fundamental part of studies of the life history of fish. In commercial marine fisheries, it is a key area in the monitoring, assessment and management of fish stocks because age determined parameters (such as age profiles, age at first maturity, spawning frequency, recruitment success, and growth and mortality) underlie the population dynamics used to perform fish stock assessments.

What do we do?

The otoliths (ear bones) from eight commercial species – cod, haddock, whiting, saithe, anglerfish, megrim, herring and mackerel – are collected and examined. Of the eight fish listed, all are used for assessment purposes except anglerfish and megrim.

Around 40,000 otoliths from demersal fish, such as cod, haddock and other whitefish are sampled annually from a combination of commercial landings (53%), observer cruises (19%) and research vessel surveys (28%).

For pelagic species, such as mackerel and herring, around 13,000 are sampled from commercial landings and research vessel surveys.

Otoliths from commercial landings are collected by Marine Scotland on dedicated trips to Scottish ports such as Peterhead, Fraserburgh, Ullapool and Kinlochbervie, whereas landings at Lerwick and Scalloway are performed by the North Atlantic Fisheries College in Shetland (NAFC).

Those collected at fish markets are usually mounted by the staff collecting them except those collected by NAFC, which are sent to the laboratory for processing.

Where possible, on research survey trips, age reading is done at sea and the ages are recorded online before the vessel returns to port.

Quality control

More than one person is involved in ageing a fish. When the principal sampler (known as a 'reader') has completed their readings, a subsample of the otoliths is read by all others capable of interpreting that species, to ensure agreement. An expert group - the European Age Readers Forum (EARF) - has been established to assist readers with all aspects of the age estimation process. It will become a repository for reference images of all species for which age estimation is carried out and a place to seek help and exchange ideas with colleagues in other countries.



SAMPLING FISH ON THE MARKET COLLECTING OTOLITHS

Who carries out the work?

Marine Scotland currently has three fully trained, multi-species readers responsible for age estimation duties, with three others under training (it can take several years to train a person to become proficient in age estimation). Since age determination of fish stocks plays an extremely important role in fisheries management and assessment, an effective training programme is essential to ensure continued accuracy and precision in the data supplied to assessment working groups.

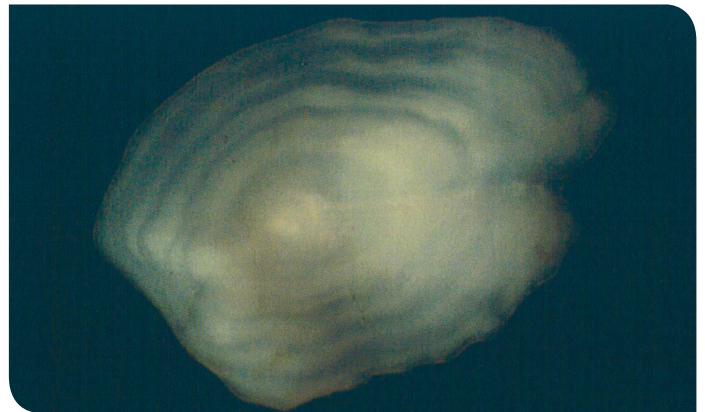


IMAGE OF 5 YEAR OLD MEGRIM OTOLITH

