

Question

How often can scallop juveniles (spat) be measured to assess their growth in field trials, without handling them too frequently?

Experimental Methods

Laboratory Trials

Samples of 30 small hatchery-reared spat of two size groups (A and B) were taken in December (experiment 1) and May (experiment 2) and further divided into three treatments. All individuals were measured initially (shell height, mm) using hand-held callipers (Photo 1) and placed into mesh-based trays (experiment 1, Photo 2) or up-welling cylinders (experiment 2, Photo 3) and held in a through-flow of unfiltered seawater (salinity > 30 psu). Scallops were sampled at monthly, 2-monthly and 3-monthly intervals. Sampling was designed to simulate that which might be carried out in the field (Photo 1).



Photo 1: Sampling

All scallops were removed from their container and each individual measured. Any dead scallops were counted and discarded. This took 10-15 min, after which the scallops were returned to their containers in seawater and not disturbed until the next sample was taken.



Photo 2:

Mesh based trays containing scallops in a through-flow of seawater.



Photo 3:

Up-welling cylinders containing scallops in a through-flow of seawater.

Field Trials

In July 1998 and 1999, hatchery-reared spat were divided into two groups of 50 animals and planted out in nets at Loch Fyne. Initial shell height of these was 13 mm. One group was measured in April and October (only); the other group was also measured at monthly intervals between these sampling dates. Final measurements were taken in October 2000.

Results

Laboratory Trials

The sizes of scallops at each sampling are shown in Figures 1 (experiment 1) and 2 (experiment 2). In experiment 1, average mortality (both size groups) was 10.1% per month (monthly samples), 6.23% per month (2-monthly treatment) and 2.22% per month (3-monthly sample). There was no mortality in any of the treatments in experiment 2.

Field Trials

In October 2000, there was no significant difference in growth or survival of the group of spat measured monthly during the summer, compared with the group measured in April and October (only). This was true for scallops planted out in 1998, which had grown to around 67 mm, and 1999 (55 mm).

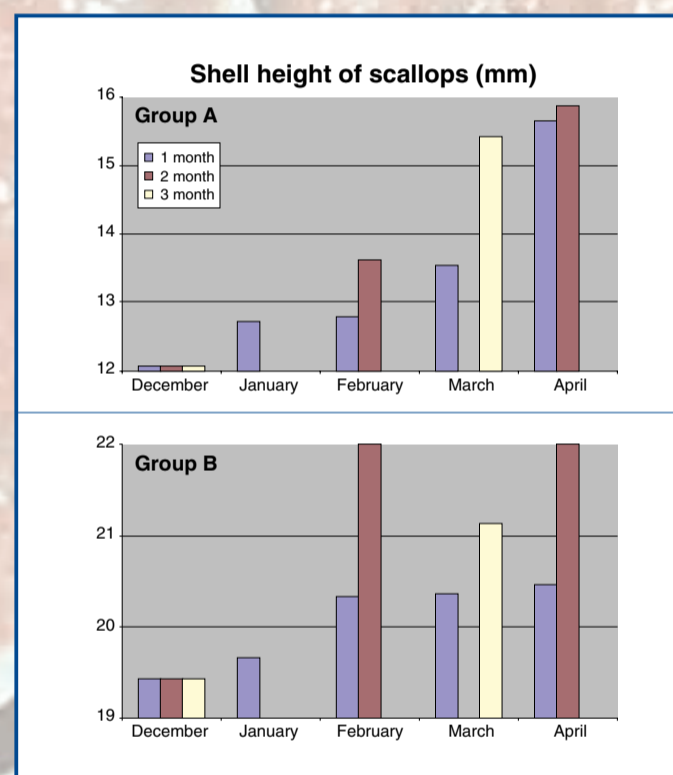


Figure 1:

Experiment 1 (winter/spring). Scallops of the same initial size and sampled monthly were nearly always smaller than scallops sampled less frequently, and usually significantly so.

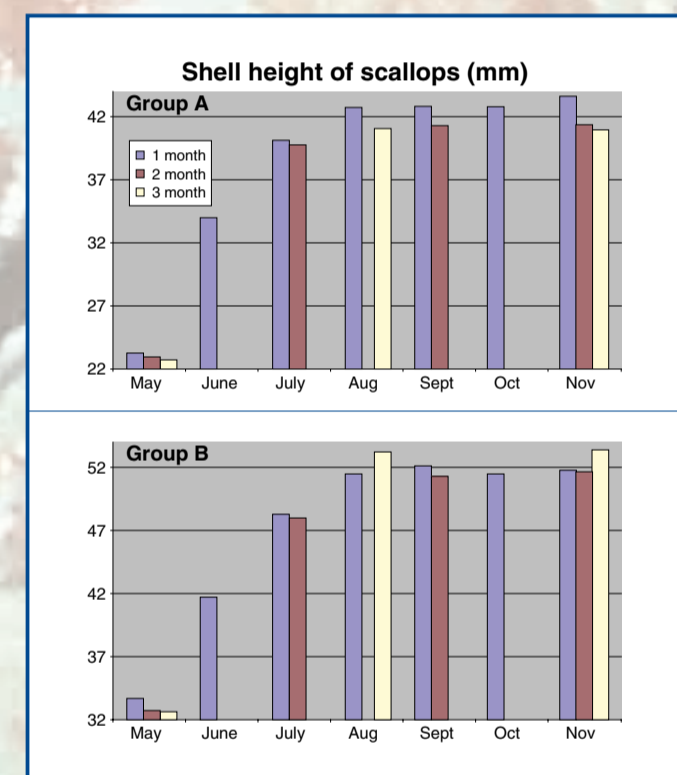


Figure 2:

Experiment 2 (summer/autumn). There was only one instance (Group B, August) in which monthly sampled scallops were significantly smaller than scallops sampled less frequently. In all other cases monthly sampled scallops grew better, sometimes significantly so. Condition index (ratio of dry meat weight to dry shell weight) of the scallops at the end of experiment 2 was similar in all treatments for both size groups.

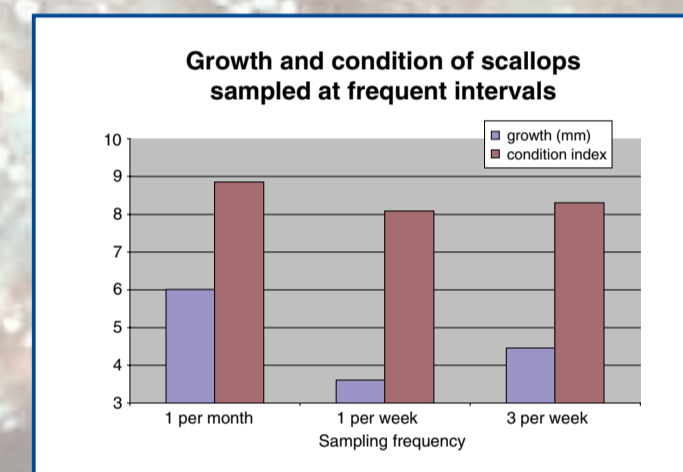


Figure 3:

Handling more frequently than once a month during the summer may reduce the growth and condition of king scallops.

Conclusions

Growth and survival of king scallops is not affected by sampling for measurement at monthly intervals during or immediately following the season of most active growth (summer/autumn). During the seasons when the juveniles are growing slowly (winter/early spring), when regular sampling is less important, monthly sampling gives reduced growth and higher mortalities.

Partners

The Centre for Environment, Fisheries & Aquaculture Science, Loch Fyne Seafarms Ltd., University of Southampton Oceanography Department, Devon Sea Fisheries Committee, Quest Holdings, Portland.