**INTRODUCTION**

Sea lice are an economic and environmental concern for fish farms and for the wild fisheries. The fish farming industry in Scotland spends millions of pounds each year in an effort to prevent sea lice infestations on farms, yet high levels of lice on farms can still occur. To date little is known about the distribution of sea lice larvae, perhaps a greater understanding of sea lice larval distributions could lead to an initiative which might alleviate sea lice infestations on fish farms.

Sea lice are parasitic copepods from the family Caligidae. Caligidae copepods have a lifecycle consisting of 10 stages, the first two are naupliar and the third is the infective copepodid stage. These three stages are free-swimming, exist in the plankton, and feed off the energy reserves of their body. Under laboratory conditions, copepodids have been found to survive for 2-30 days. If the copepodid finds a host, the remaining seven stages of the lifecycle develop on the body of the salmonid, feeding off the skin, mucus and blood of the fish. Sea lice reproduce sexually. A female carrying eggs is termed as gravid.

During winter 2001/02 a plankton survey was conducted to examine the distribution of sea lice larvae within Loch Shieldaig. The survey consisted of weekly collections of plankton samples from 5 offshore sample sites (A, B, C, D and E) using a boat, and one shoreline site (S) by wading.

**Main Observations**

Peaks in sea lice larvae density were measured in the plankton of the loch directly after estimated numbers of gravid lice reached a maximum at the local farm.

Throughout the loch, the greatest densities of lice larvae were found towards the head of the loch (site A) and near the mouth of the River Shieldaig (site S).

The low proportion of nauplii at site A and the absence of nauplii at site S suggest that the larvae found at these sites, were transported there from elsewhere.

The peak larvae densities recorded both near the river mouth and at site A occurred when fresh water input was low.

During the plankton survey, a high degree of temporal and spatial variability was evident in sea lice larvae distribution.

This study has highlighted the need for further research into lice larval distributions, and has shown this to be an area of particular importance for relocation of existing farms and the siting of new farms.

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