

## **KEYNOTE: INFECTIOUS SALMON ANAEMIA: EMERGENCE, CONTROL AND SURVEILLANCE IN AQUACULTURE**

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Key words: Infectious salmon anaemia

Infectious salmon anaemia (ISA) is a highly infectious orthomyxoviral disease of farmed Atlantic salmon (*Salmo salar*) caused by ISA virus (ISAV). Clinical ISA has caused major losses to salmon farmers in six countries. The disease was first reported from Norway in 1984, where it is still widespread. Subsequently it occurred in Canada, the USA, the Faeroe Islands and Chile. An outbreak occurred in Scotland in 1998/9 and this was eradicated at a cost then of over £20M.

The epidemiology of an outbreak of infectious salmon anaemia (ISA) in the Scottish Shetland Islands during 2008/9 is described. A total of six sites were confirmed ISA positive. Spread of the virus via movement of fish between marine sites, harvest vessels, movements of smolts and wild fish appear to have been of little or no importance. The spread is likely to be due to hydrodynamic currents, although local intra-company activity may have caused some spread. The use of management areas by Marine Scotland, defined by a simple but robust model partly derived from tidal excursions, appears to have been effective in restricting the spread of infection to a small area however spread within this area has been extensive. This localised water-borne spread is in contrast to a previous outbreak in 1998/9 which was spread over a wide geographic area by transport of fish and harvest vessels. The development following the 1998/9 outbreak of codes of practice that limited marine site-to-site movement of live fish and improved disinfection of vessels and processing plant waste may explain why the 2008/9 spread of infection was localised. Depopulation of confirmed sites is a key element of eradication and this has been achieved within 7 weeks of confirmation, although the last confirmed case suggests subclinical infection may persist undetected for months. The origin of the 2008/9 outbreak is unknown, it could be either local evolution from an avirulent strain of ISAV or with importation of ova or equipment; however the virus responsible for the 2008/9 outbreak belongs to a different genogroup (group 1) to the 1998/9 virus (group 3). Lack of synchronous following of management areas increases the risk of ISA re-emergence. Movement of fish between sites in different management areas represents the greatest risk of regional-scale spread should this occur.

