

Risk mapping as a tool in aquatic animal health

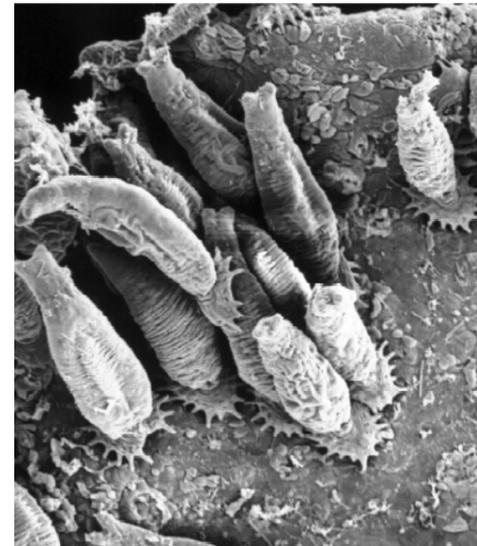


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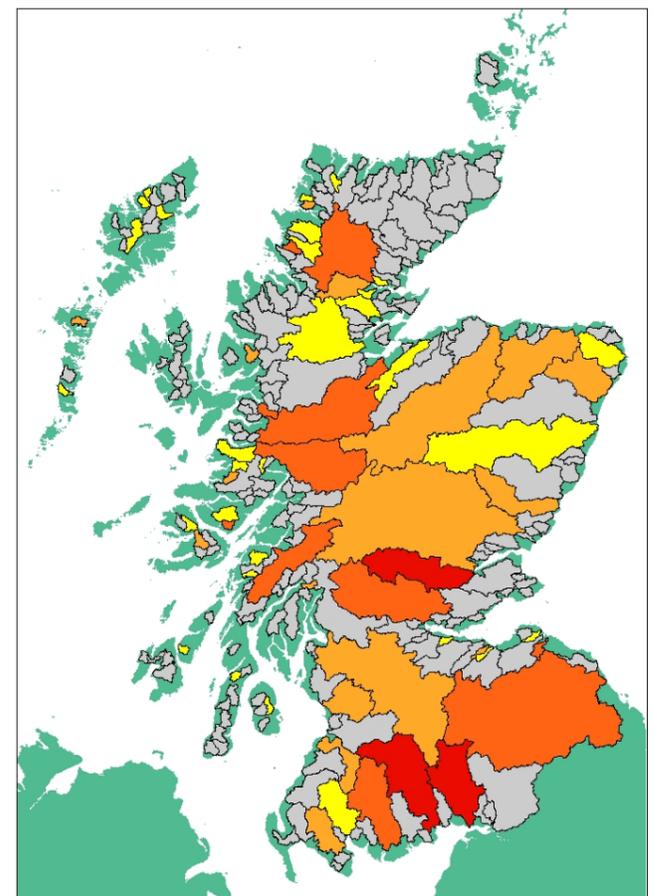
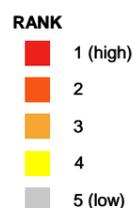
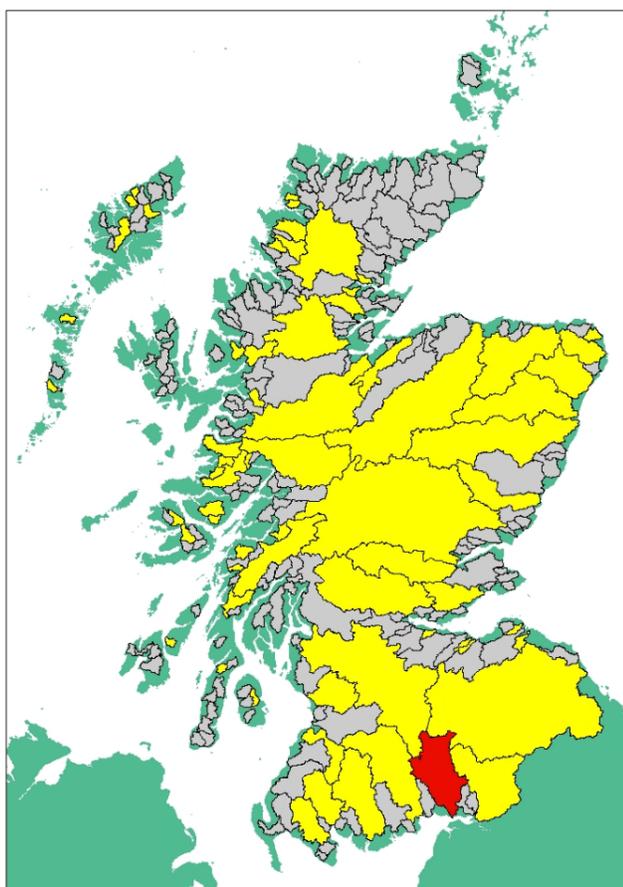
Introduction

- New EU fish health legislation will be applied in August 2008 requiring member states to implement a risk based surveillance system to monitor aquatic animal health.
- In this study we examine the use of risk mapping as a tool in risk based surveillance.
- The risk of introduction of the exotic fish parasite *Gyrodactylus salaris* (Gs) into Scotland was used to develop methodology and assess feasibility of the approach.
- Gs is a viviparous ectoparasite that reproduces and survives only on Atlantic salmon and Rainbow trout (asymptomatic on rainbow trout) in freshwater¹. Gs infection can lead to >90% decline in salmon wild populations.
- A qualitative risk analysis indicated import and movement of live fish and importation of dead fish as potential mechanisms of introduction to the UK².



Methodology

- Data was collected on location and scale of freshwater salmonid farming (including production and egg imports - there were no live fish imports) and fish processing for the year 2005 in Scotland.
- A risk score was calculated for each super catchment (drainage basin) in Scotland.
- Data entered in excel spreadsheets and linked to GIS and ArcView9 (ESRI)TM software. Super catchments were colour coded according to risk scores.
- Two scenarios were tested:



Scenario A

The presence of a farm and a processing plant in a super catchment increase risk of Gs introduction.

Risk score for a super catchment is a product of the number of: inactive farms, producing farms, importing farms and processing plants handling salmonids.

Scenario B

Production and egg importation increase the risk of introduction of Gs.

Production = scale (annual %) categorised and ranked.
Egg importation = Risk score sum of :
Exporter Gs status (Gs free or Gs present or unknown), source (total number and consignments) and volume (ranked as for production).

Conclusions

- Risk mapping provides a useful tool in risk based surveillance to identify areas where surveillance should be targeted.
- The risk maps produced are only as good as the quality and accuracy of the data used. Assumptions and scoring should be explicitly stated.
- The technical construction of database linked to GIS software offers the ability to update data, for example annually or less, to provide accurate real-time maps of risk.

References

1. Bakke TA, Jansen PA & Jennedy CR (1991) The host specificity of *Gyrodactylus salaris* Malmberg (Platyhelminthes, Monogenea): Suseptability of *Oncorhynchus mykiss* (Walbaum) under experimental conditions. *J Fish Biol* 41:499-507.
2. Peeler EJ & Thrush MA (2004) Qualitative analysis of the risk of introducing *Gyrodactylus salaris* into the United Kingdom. *Dis Aquat org* 62: 103-113.