A scientific basis for policy makers: bacterial kidney disease (BKD) in Scottish rainbow trout farms

Fisheries Research Services

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Introduction

Bacterial Kidney Disease (BKD), caused by *Renibacterium salmoninarum,* (Sanders & Fryer 1980), can affect wild and cultured salmonids (OIE 2006). The first record in Scottish farmed rainbow trout (*Oncorhynchus mykiss*) was in 1976 (Bruno 1986). The prevalence of *R. salmoninarum* in Scottish farmed fish has been low (Bruno 2004), however it has persisted in several continuously stocked rainbow trout farms. Aquaculture is important to the Scottish economy with 7492 tonnes of farmed rainbow trout produced in 2006 (Smith 2006). Clinical BKD can cause economic impacts through mortality, reduced growth rates & movement restrictions. In the UK BKD is a Notifiable disease with a long term control strategy and more recently an approved eradication programme.

Problem

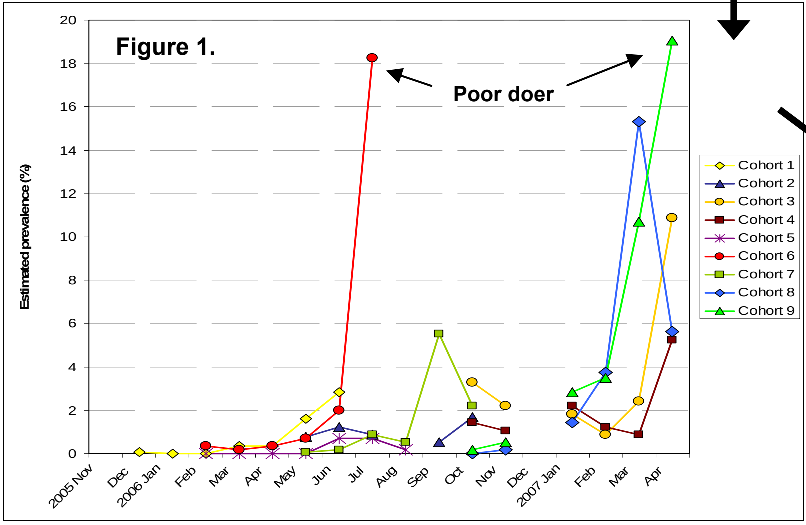
- ► Farms with long-term BKD movement controls.
- ► Continuously stocked, no opportunity to revoke.

Solution

- ► Investigate ways of breaking infection?

Obtaining data

- ► 3 trout farms, 9 cohorts of *R. salmoninarum* negative fingerlings stocked.
- ► Regular screening of 600 per cohort on these farms using qPCR.
- ► Wider testing of 11 established stocks at one of the farms undertaken.
- ► Prevalence calculated.



Diagnostic results

- ► All 9 cohorts tested positive (Figure 1).
- ► Ten of the 11 established stocks tested positive.
- ► Tendency for higher prevalence in "Poor doer" fish.

Other reservoirs?

- ► 1590 Wild & escaped fish tested.
- ► Low prevalence of infection (Table 1).
- ► No evidence for reservoirs in sediment/water.
- ► Flow likely from farmed to wild fish.
- ► Fish farm is main reservoir?

Table 1. Wild & escaped fish tested		Number (positive pools)	Estimated prevalence (%)
Rainbow trout (escapes)		263 (3)	1.14
Minnow (*Phoxinus phoxinus*)		426 (1)	0.23
3-spined-stickleback (*Gasterosteus aculeatus*)		597 (1)	0.17
Atlantic salmon (*Salmo salar*)		10	0
Brown trout (*Salmo trutta*)		294	0
Total		1590	0.31

Fallow the farms to break the infection cycles?

- ► Farms persistently infected.
- ► Established stocks and poor doer fish are increased risks.
- ► Clear the farms to remove the main infection sources?

Advice to policy makers

- ► Eradication on a cage-by cage basis is not possible.
- ► On-site reservoirs identified as most important (horizontal transmission).
- ► Fallowing is the best option to break infection cycles.
- ► Future monitoring should be undertaken (farm and wild).

Industry response

- ► Some farms subsequently culled poor doer fish.
- ► Planning to implement full farm fallowing commencing 2009.

References

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