Annual Report

# The surveillance programme for viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN) in Norway 2017

Veterinærinstituttet
Norwegian Veterinary Institute

Mattilsynet

# The surveillance programme for viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN) in Norway 2017

## Content



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## Summary

This surveillance programme has a risk-based approach. The core surveillance activity was the routine clinical inspections on farmed salmonid sites and analyses of samples collected from diseased fish. Viral haemorrhagic septicaemia virus and infectious haematopoietic necrosis virus were not detected at any of the sites tested in the 2017 surveillance.

## Introduction

Viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN) are two important diseases in salmonid fish caused by rhabdovirus infections (1).

VHS has most frequently been recorded in farmed rainbow trout, but may also cause losses in other wild and farmed fish species, both marine and freshwater (2, 3). Norway obtained disease free status for VHS and IHN in 1994 (4). VHS was diagnosed in farmed rainbow trout in Norway in 2007 and disease free status was temporarily suspended (5, 6). Measures to eliminate the disease and prevent its spread were immediately taken by the Norwegian Food Safety Authority (NFSA). In 2011, Norway regained its VHS free status.

Outbreaks of IHN have resulted in significant economic losses in farmed rainbow trout and salmon in North America and Europe, and the disease has also had an impact on wild populations of Pacific salmon. In 2017 IHN was for the first time detected in Finland. The disease was detected in rainbow trout (7). The disease has never been diagnosed in Norway.

The Norwegian Veterinary Institute (NVI) coordinates the surveillance programme and publishes the overall results in annual reports available on the NVI website (www.vetinst.no). In 2017, all fish samples were analysed at the NVI. The NFSA was runningly updated on the test results at site level, through the "Health data on web"- portal.

## Aims

The aim of the programme is to document the absence of VHS virus (VHSV) and IHN virus (IHNV) in farmed salmonides in order to maintain Norway's VHS and IHN free status.

## Materials and methods

The surveillance programme has a risk-based approach (8), where the core surveillance activity was the routine clinical inspections on farmed salmonid sites carried out by the fish health services (FHS) and laboratory investigation of suspicious samples. Sites with farmed salmonids are inspected by FHS at least six times a year in a normal situation. Additional inspections may be required at the time of sea transfer of smolt and in cases of increased mortality or suspicion of disease. The routine inspections should be spread approximately equally throughout the year (9).

In 2017, the surveillance programme for VHS included laboratory investigation of relevant samples from active sites with both rainbow trout and salmon. Additionally, samples from lumpfish used as cleaner fish, were included. The programme for IHN was primarily focused on samples from sites with salmon. The samples were submitted by the FHS in connection with disease investigation or the NFSA in connection with inspections on sites with rainbow trout targeting moribund or newly dead fish. An active site was defined as having stocked fish for at least three months of the year. In 2017, 63 marine sites with rainbow trout and 766 marine sites with Atlantic salmon were registered as active. These numbers are based on monthly reports on production statistics to the Norwegian Authorities, biomass data obtained as described in Kristoffersen et al 2009 (10). Active freshwater sites are not included in these numbers (data not available).

Samples on RNAlater™ submitted to the NVI were processed and analysed for VHSV and IHNV by real-time RT-PCR with VHSV primers and probe from Jonstrup et al. 2013 and IHNV primers and probe modified from Liu et al. 2008 (11, 12).

## Results and Discussion

In total, 379 fish samples from 14 of the sites with rainbow trout and 60 of the sites with Atlantic salmon were tested for VHSV in 2017. Additionally, 103 samples from 17 sites with lumpfish were tested. All samples were negative (Figure 1, 2).

Of the fish samples included in the VHSV surveillance programme, 85 were from rainbow trout and 294 were from Atlantic salmon. The mean number of samples per site was 4 from both rainbow trout and Atlantic salmon sites, respectively.

In total, 295 fish samples from 59 sites with Atlantic salmon and 3 sites with rainbow trout were tested for IHNV in 2017. All samples were negative (Figure 1, 2). The mean number of samples per site was 3.

Neither VHSV- nor IHNV-positive salmonids were detected during the risk based surveillance programme in 2017.

The performance of the routine clinical inspections in surveillance for freedom from VHS was evaluated in 2016, using a stochastic simulation model (13). Model results indicate that the current surveillance system, based on routine inspections by the FHS has a high capability for detecting VHS and that there is a high probability of freedom from VHS in Norwegian marine farmed salmonids (PFree >95%). Sensitivity analysis identified the probabilities that samples are submitted and submitted samples are tested, as the most influential input variables. The model provides a surveillance platform for similar exotic viral infectious diseases in marine salmonid farming in Norway, if they share similar risk factors, e.g. IHN.

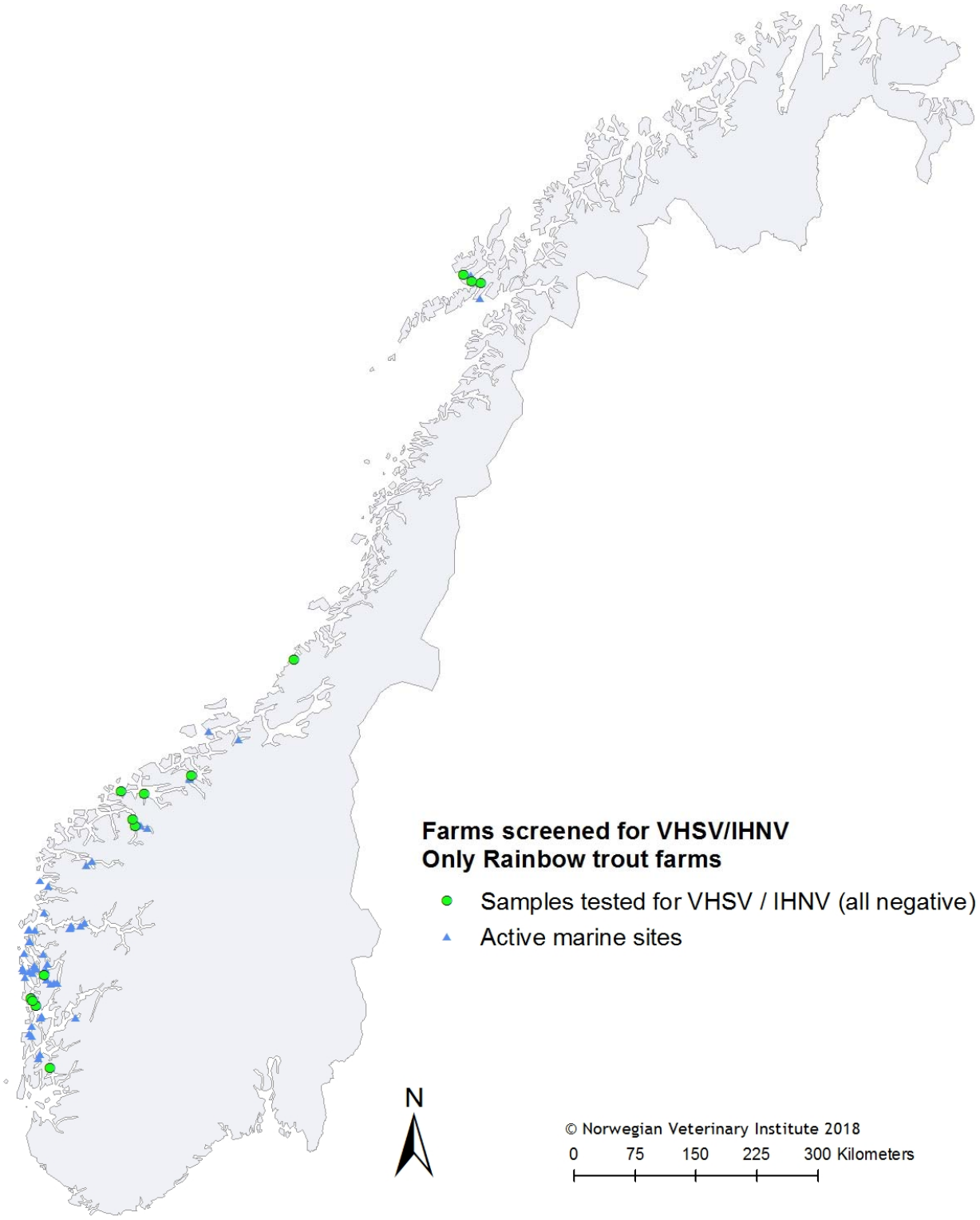


**Figure 1**. Map of active marine sites with rainbow trout in 2017. Active freshwater sites are not shown (data not available). Green circle symbols indicate sites included in the 2017 surveillance programme.

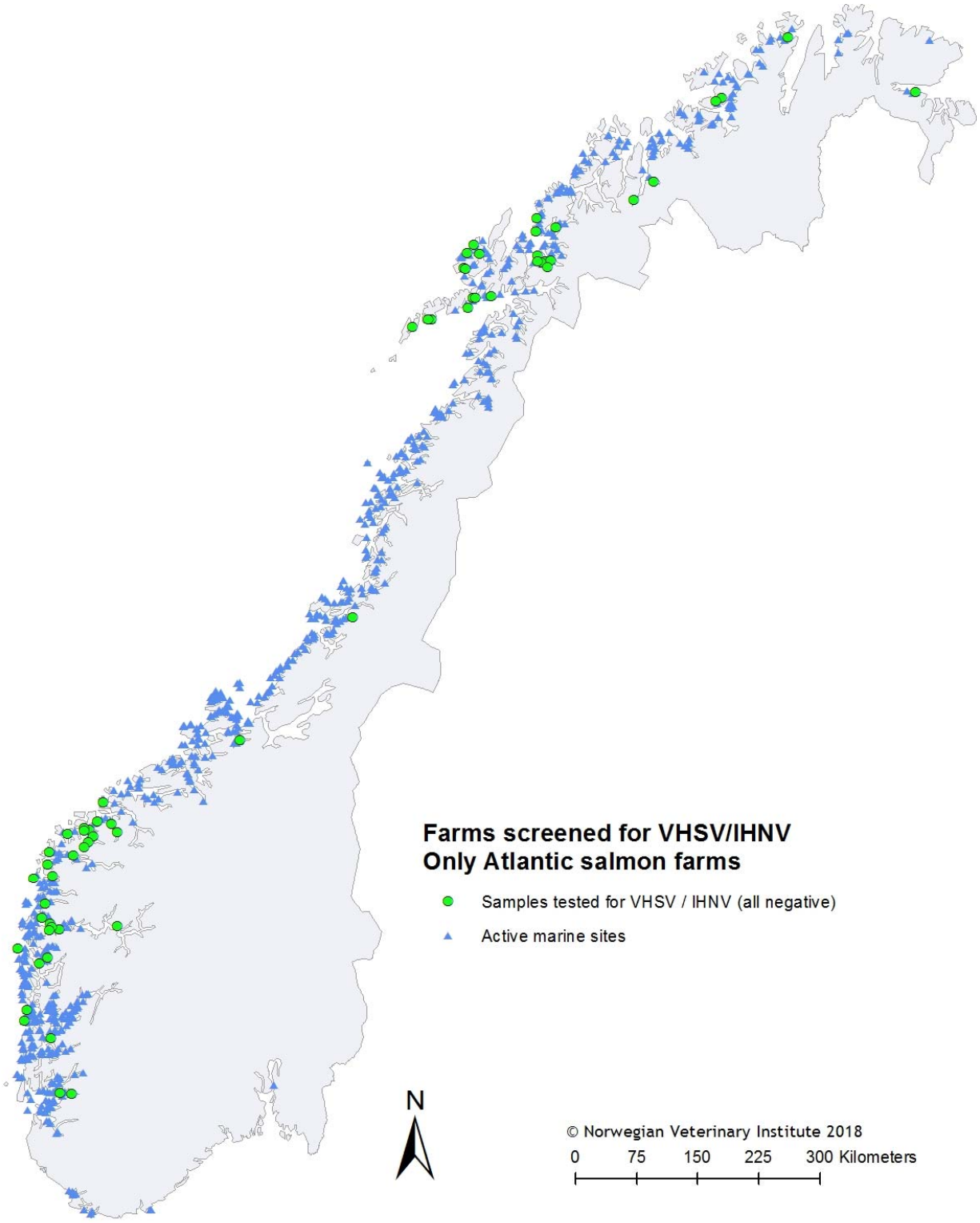


**Figure 2.** Map of active marine sites with Atlantic salmon in 2017. Active freshwater sites are not shown (data not available). Green circle symbols indicate sites included in the 2017 surveillance programme for VHS and IHN.

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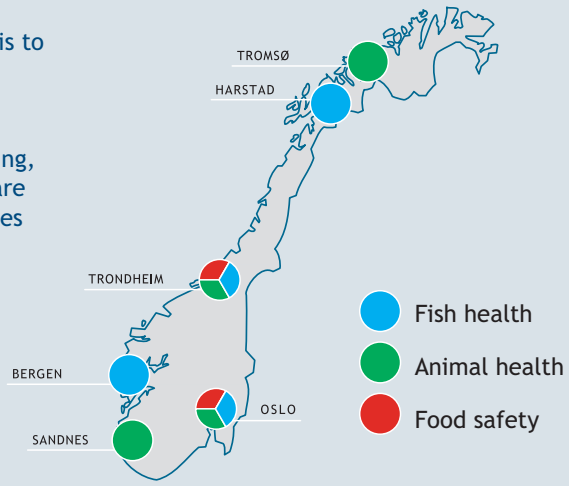


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