Annual Report

The surveillance program for infectious salmon anaemia (ISA) and bacterial kidney disease (BKD) in Norway 2016

Veterinærinstituttet
Norwegian Veterinary Institute

The surveillance program for infectious salmon anaemia (ISA) and bacterial kidney disease (BKD) in Norway 2016

Content

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Summary

Infectious salmon anaemia (ISA) (pathogenic HPR-del ISAV) and *Renibacterium salmoninarum* was not detected in conjunction with surveillance in ISA free zones and segments in 2016.

According to the received reports from private laboratories on surveillance carried out in containment area no HPR-del ISAV were detected in containments areas. However, the results are not complete for the surveillance in the containment areas as reports from one of the involved private laboratories were not submitted to the Norwegian Veterinary Institute due to formal lack of reporting obligation.

Introduction

Infectious salmon anaemia (ISA) is a serious disease in salmon caused by ISA virus (ISAV), within the Orthomyxoviridae family. ISA is a listed disease in Norway, as well as within EU (Council directive 2006/88) and OIE (1). The disease was for the first time described in Atlantic salmon in Norway in 1984 and has since been reported in several countries: USA, UK, Scotland, Canada, Faroe Islands, and Chile. In Norway, the number of outbreaks peaked in the early 1990s with more than 80 cases per year. In the late 80ies and early 90ies several measures were implemented by the Norwegian Food Safety Authority (NFSA) in order to combat and limit spread of the disease. Since 1993, the number of annual outbreaks has varied between 1 and 20, and ISA is still a recurring challenge to the salmon farming industry in Norway. There are two main variants of ISAV, one being associated with ISA outbreaks, virulent and highly pathogenic, termed HPR-deleted ISAV (HPR-del ISAV), and the other variant termed HPR0 ISAV, assumed non-pathogenic.

Bacterial kidney disease (BKD) is a chronic disease of salmonid fish caused by *Renibacterium salmoninarum*, first diagnosed in Norway in 1980. BKD is a list 3 disease in Norway. *R. salmoninarum* can be transmitted vertically from one generation to the next inside the eggs. Surveillance of brood fish for BKD is therefore important. More information on ISA and BKD can be found on www.vetinst.no.

For zones and compartments, the NFSA has declared and received approval for ISA-free farms based on both historical freedom and targeted surveillance of ISA (HPR-del ISAV) in accordance with requirements in the Council directive 2006/88/EF. Some farms are, in conjunction with the surveillance in ISA free zones and compartments, also declared free for bacterial kidney disease (BKD), based on targeted surveillance for *R. salmoninarum*.

When a farm is officially declared infected with ISA (HPR-del ISAV), a containment area, including protection - and a surveillance zone, is immediately established around the affected site by NFSA. Strict, national regulations are implemented in order to limit the spread of the disease, including targeted surveillance for HPR-del ISAV.

Aims

1) To collect and summarize journal data needed to obtain and maintain freedom from ISA and BKD in seawater and freshwater salmonid fish farms in conjunction with ISA free zones and compartments.

2) Collect and summarize journal data in order to provide documentation of the surveillance for ISA (HPR-del ISAV) carried out in containment areas that is established in the vicinity of farm(s) officially declared infected with ISA

Materials and methods

Surveillance in conjunction with ISA free zones and compartments include both inspection and targeted sampling. Samplings were carried out in two periods both for ISA and for BKD (see www.mattilsynet.no). Laboratory analyses (PCR) for ISAV and *R. salmoninarum* were carried out by private laboratories appointed by NFSA (Patogen Analyse AS and Pharmaq Analytiq). Laboratory results from analyses of fish samples (ISAV; heart, organ, gills, eggs, milt, ovarian fluid and fry and for *R. salmoninarum*; kidney, milt and ovarian fluid) should be submitted to the Norwegian Veterinary Institute (NVI) according to a monthly routine.

All farms located in the containment area are subject to targeted surveillance with risk-based sampling for ISAV once a month until the restrictions for the containment area are lifted. Between samplings, salmon farms in the containment area are inspected by the farmer on a daily basis and moribund or freshly dead fish, but not decomposed fish, is selected for laboratory investigations for ISAV by PCR. In addition, the fish health services (FHS) may further select fish for sampling at their mandatory monthly inspections. A total of 10-20 targeted samples are collected each month from these sites. From Atlantic salmon, the samples include heart and kidney tissues. In cases of Rainbow trout, the samples included skin swabs. If a salmon site in the containment area is on suspicion for ISA (e.g. increased mortality), samples for histological analyses and virus detection should immediately be submitted to NVI. The laboratory analyses were carried out by appointed private laboratories and by the NVI. NVI is also responsible to collate the data and present the results.

Results and Discussion

In total, 5575 samples from 41 farms with Atlantic salmon and 110 samples from four farms with Rainbow trout were investigated for ISAV in conjunction with ISA free zones or compartments. Geographical locations of the fish farms are shown in figure 1a-c. HPR-del ISAV was not detected, while HPR0 ISAV was detected in samples from four of the farms with Atlantic salmon.

With regard to *R. salmoninarum*, a total number of 3339 samples from 31 farms with Atlantic salmon and 193 samples from seven farms with Rainbow trout were investigated in conjunction with the surveillance in ISA free zones and compartments. Geographical locations of the fish farms are shown in figure 2a-c. *R. salmoninarum* was not detected in any of the samples.

The surveillance data includes only data from farms in established ISA free zones and segments, and not data from farms being in process of obtaining ISA free status.

In total, 2542 organ samples from 50 farms with Atlantic salmon and 324 samples from eight farms with Rainbow trout were investigated in conjunction with ISA containment area in the period November 2015 to December 2016. HPR-del ISAV was not reported. HPR0 ISAV was detected in samples from nine farms with Atlantic salmon, and in one farm with rainbow trout. The surveillance data presented here are not complete as the NVI has received data from only one of the two private laboratories involved in analyzing samples.

Design and evaluation of the surveillance programmes are not considered in this report.

References

1. Office International des Epizooties, 2016. Manual of Diagnostic tests for Aquatic Animals. Infectious salmon anaemia. http://www.oie.int/fileadmin/Home/eng/Health_standards/aahm/current/chapitre_isav.pdf.

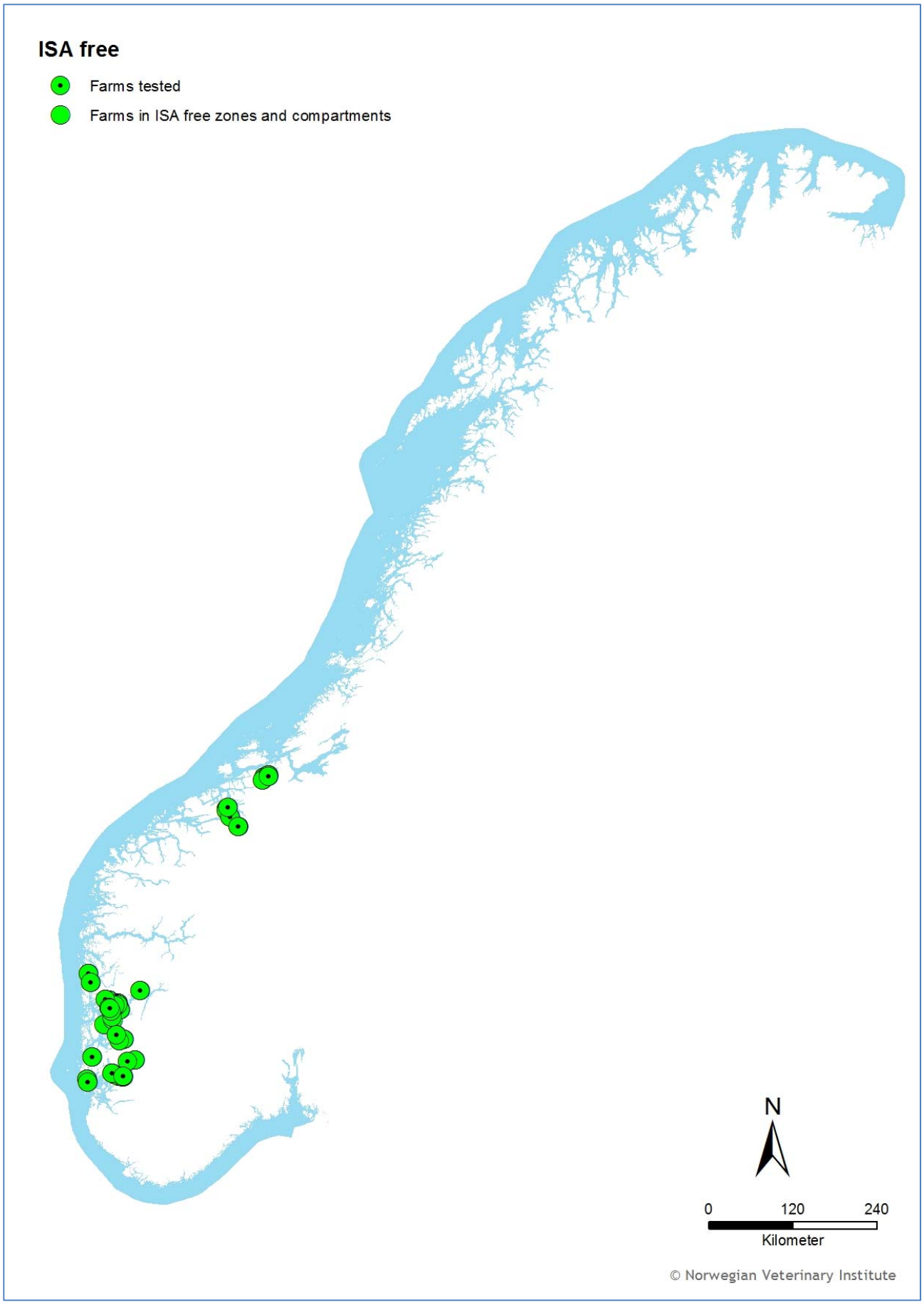

Figure 1a Geographic locations of fish farms tested for infectious salmon anaemia virus (ISAV) in conjunction with infectious salmon anaemia (ISA) free zones and compartments in 2016.

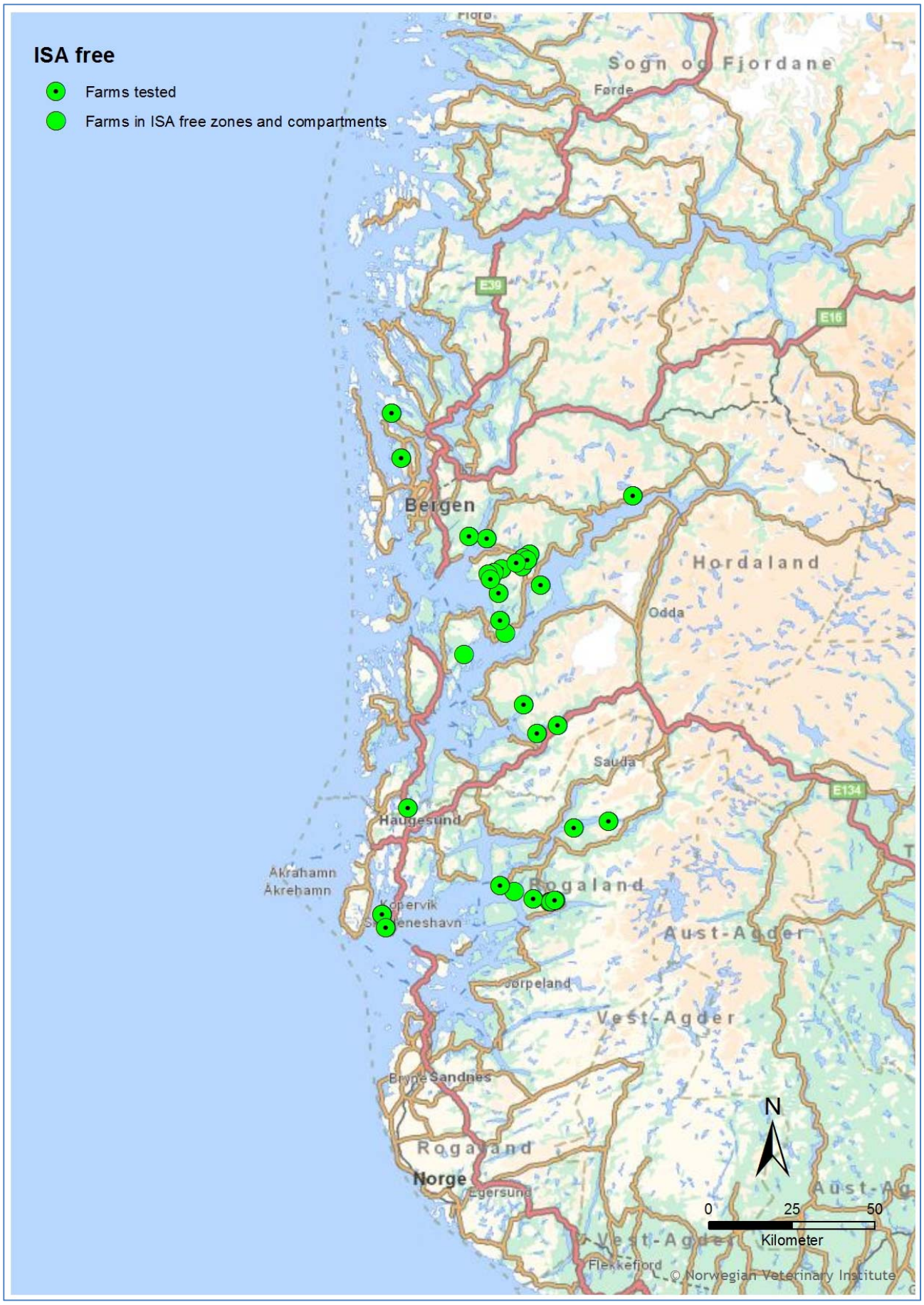

Figure 1b Geographic locations of fish farms tested for infectious salmon anaemia (ISA) in conjunction with infectious salmon anaemia (ISA) free zones and compartments in Western Norway in 2016.

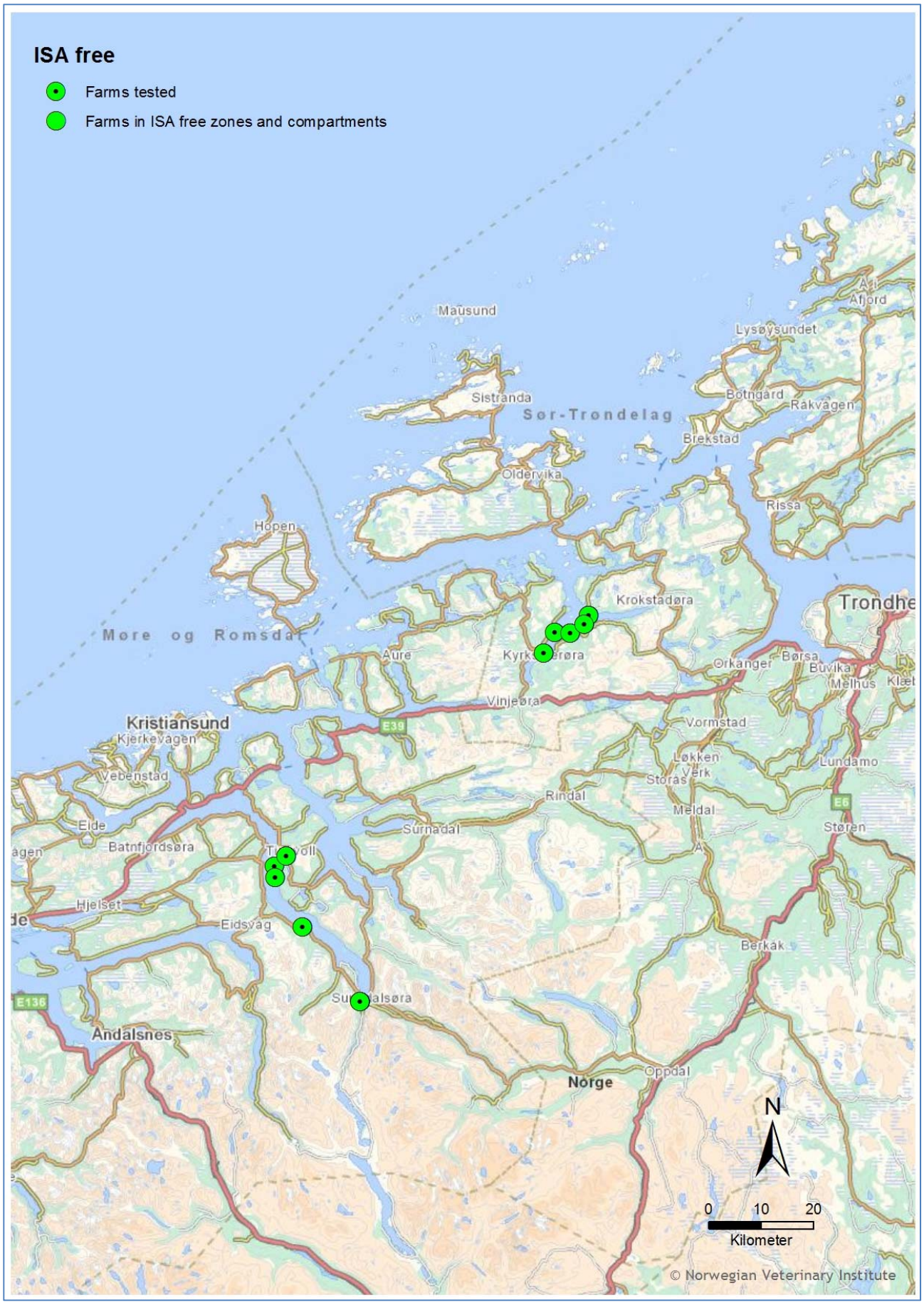

Figure 1c Geographic locations of fish farms tested for infectious salmon anaemia (ISA) in conjunction with infectious salmon anaemia (ISA) free zones and compartments in Mid-Norway in 2016.

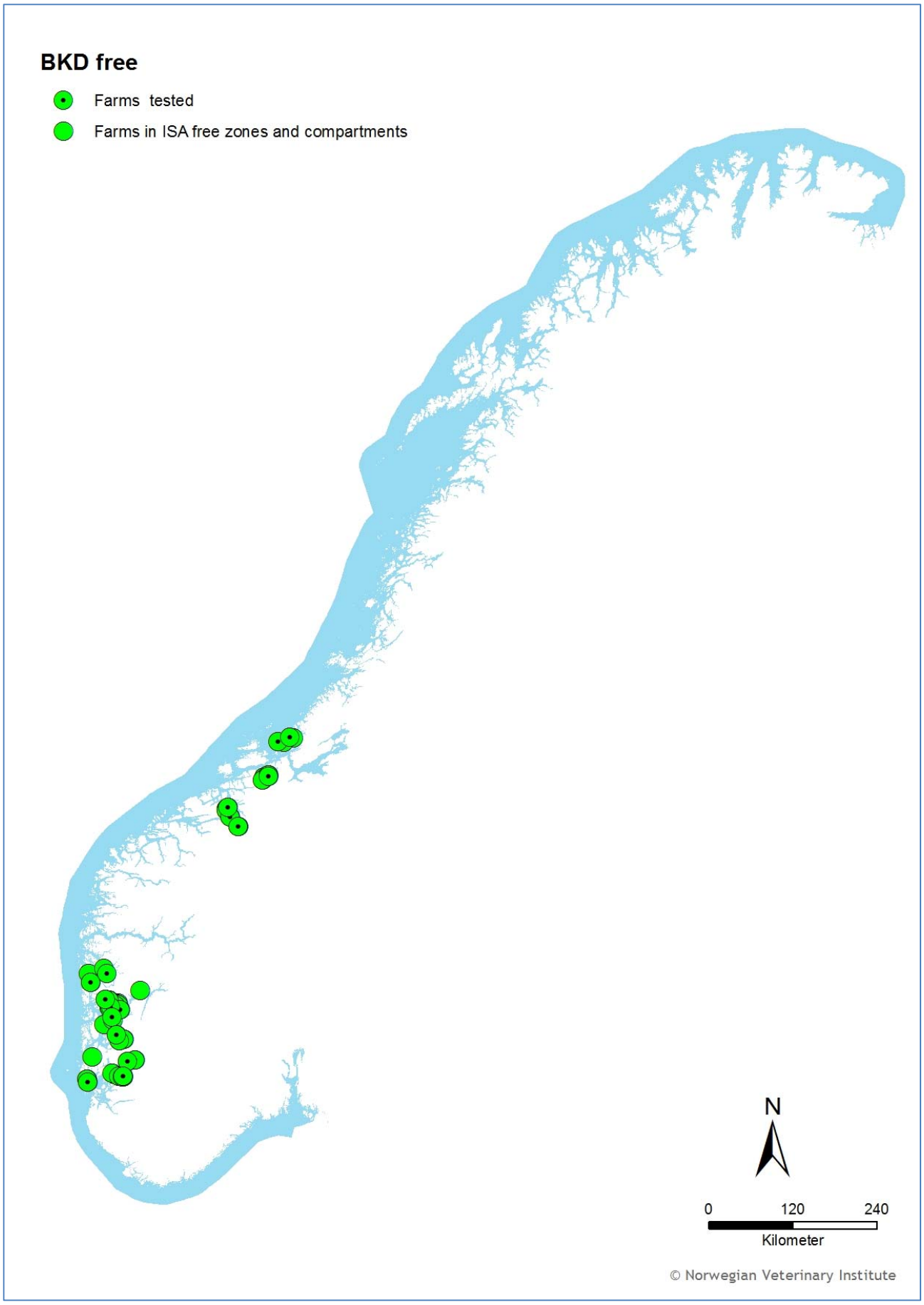

Figure 2a Geographic locations of fish farms tested for *Renibacterium salmoninarum* in conjunction with infectious salmon anaemia (ISA) free zones and compartments in 2016.

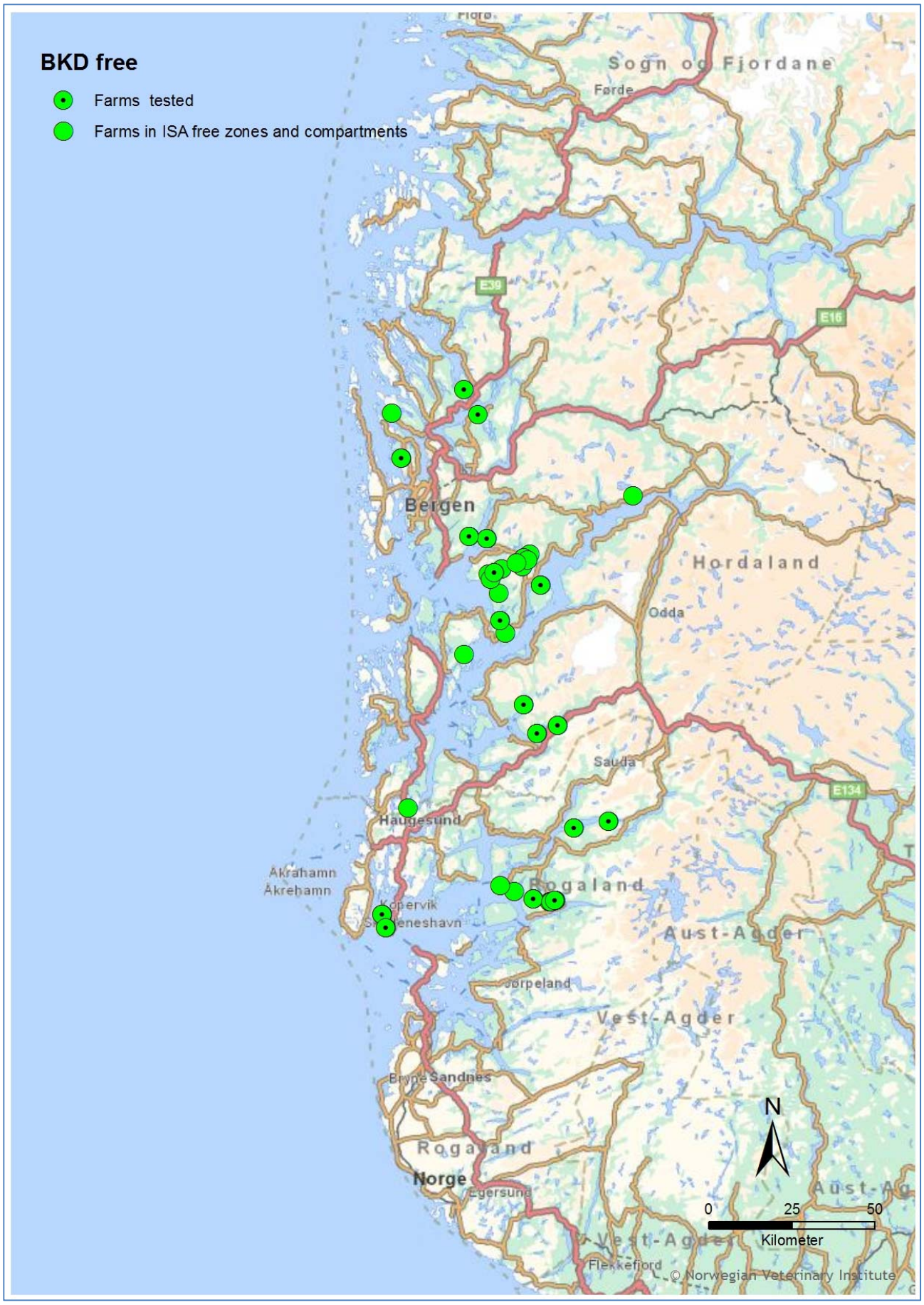

Figure 2b Geographic locations of fish farms tested for *Renibacterium salmoninarum* in conjunction with infectious salmon anaemia (ISA) free zones and compartments in Western Norway in 2016.

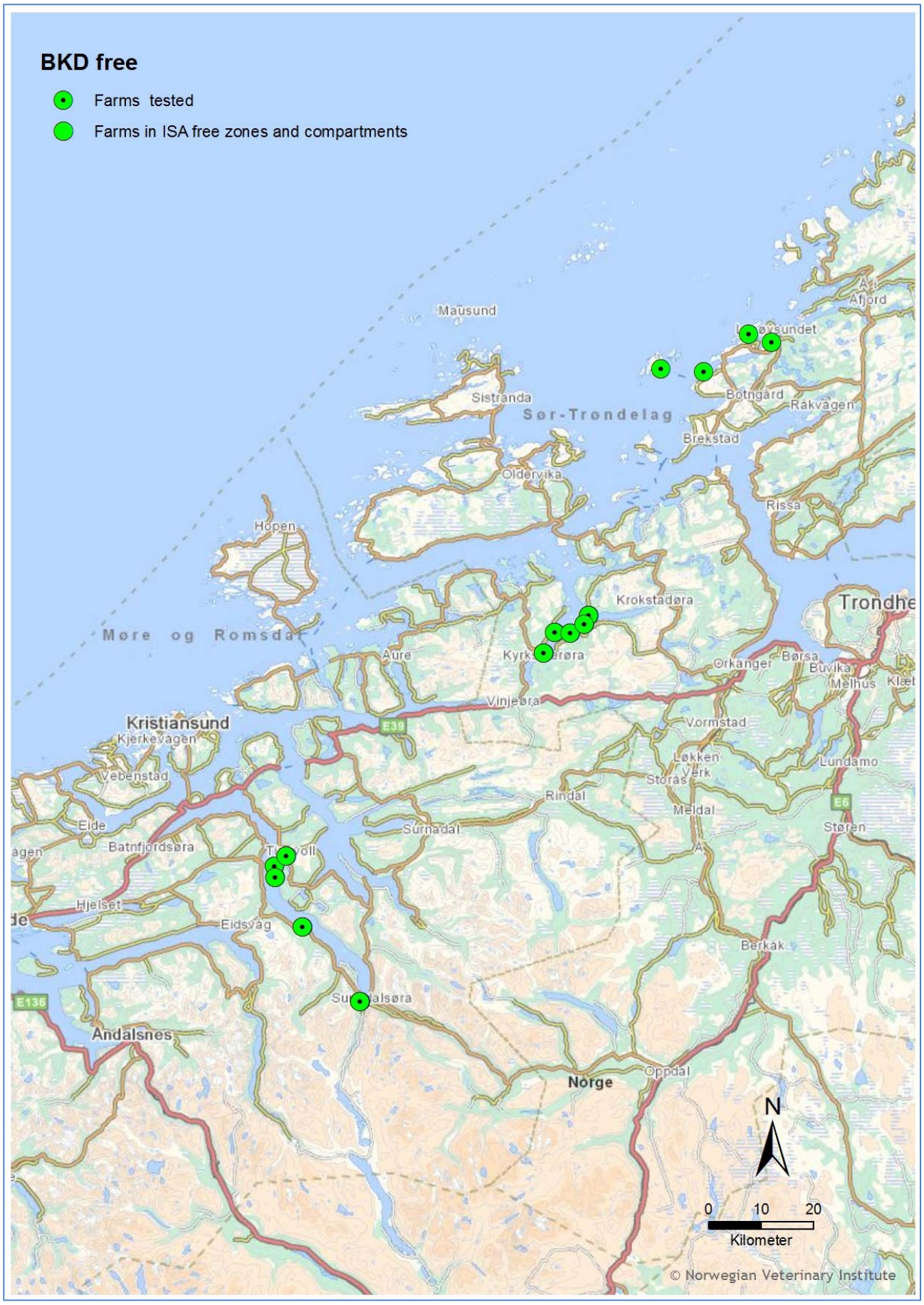

Figure 2c Geographic locations of fish farms tested for *Renibacterium salmoninarum* in conjunction with infectious salmon anaemia (ISA) free zones and compartments in Mid-Norway in 2016.

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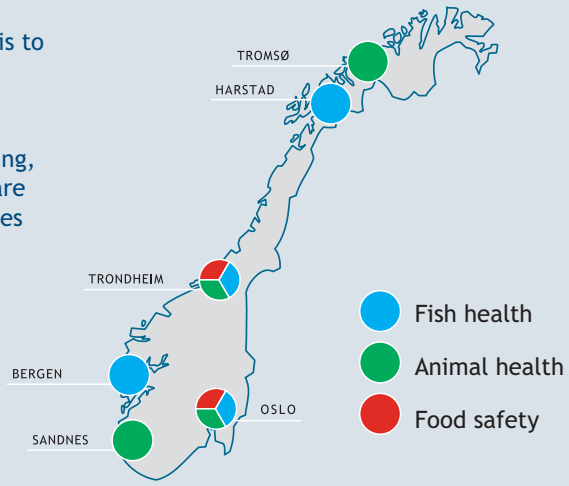

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