



North-East Atlantic Commission

NEA(18)03

***Report of the Meeting of the Working Group on
Gyrodactylus salaris in the North-East Atlantic Commission Area***

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1. In 2004, NASCO's North-East Atlantic Commission organised a Workshop to discuss the need to minimise the threat posed by *Gyrodactylus salaris* to Atlantic salmon. The Workshop developed many recommendations and, following further work, these were collated into a 'Road Map' (amended in 2006) outlining responsibilities and a timeframe for action. The 'Road Map' included recommendations on:
 - opportunities to enhance co-operation on monitoring, research and exchange of information;
 - the need for revisions to international guidelines and other measures to prevent the further spread of the parasite; and
 - strengthening of national and regional legislation and measures to prevent the spread of the parasite.
2. In view of the serious threat posed by this parasite, the North-East Atlantic Commission (the Commission) established a Working Group on *G. salaris* and meetings were held in both 2006 and 2007. In 2008, the Commission decided not to convene further meetings of the Working Group but to retain an item on its Annual Meeting agenda to allow developments in relation to the parasite to be monitored. While this provided an opportunity to report to the Commission on any new information relating to *G. salaris*, there was limited time available, few Parties / jurisdictions provided reports and those that were tabled were not comprehensive in terms of the elements in the 'Road Map'. There have, of course, been significant developments over the last ten years or so, not least in relation to international guidelines and other measures to prevent the spread of the parasite and in its eradication.
3. In 2016, the Commission agreed to reconvene the Working Group and asked that it undertake the following tasks:
 - provide a forum for exchange of information among the Parties / jurisdictions on research on, and monitoring and control programmes for, the parasite *G. salaris*;
 - review progress in relation to the Commission's 'Road Map' and advise of any changes required;
 - develop recommendations for enhanced co-operation on measures to prevent the further spread of the parasite and for its eradication in areas where it has been introduced; and
 - develop recommendations for future research.
4. The Working Group met in London during March 2017 and its main output was a revised 'Road Map' which was a considerable simplification of the 2006 'Road Map' and the Working Group recommended that the Commission consider adopting the document given the potentially devastating impacts of this parasite on wild salmon stocks if introduced.

5. At the 2017 Annual Meeting of the Commission, the European Union noted that it was unable to adopt the proposed revised 'Road Map' as there had been inadequate time to consult and it was not clear if some recommendations were consistent with EU Animal Health regulations. The Commission therefore did not adopt the revised 'Road Map' but agreed that at its 2018 meeting the Working Group would consider the need for revisions to the recommendations contained in that document to ensure consistency with NASCO Parties' animal health legislation. To this end, the European Union proposed to provide comments to the Working Group in relation to the revised 'Road Map' ahead of the Group's 2018 meeting.
6. Unfortunately, the European Union was not able to provide comments by the time the Working Group met and the Group therefore recommends that the revised 'Road Map' GSWG(17)13 should be used as the basis of best practice going forward until the Commission has agreed it formally, subject to any changes recommended by the European Union and agreed by the Commission. The Working Group is anxious to ensure that these outstanding issues are resolved as swiftly as possible, and preferably in advance of the 2018 Annual Meeting of the Commission, to enable the full adoption of the revised 'Road Map'.
7. The Working Group recommends that the 2018 meeting should remain the first in the three-year cycle of meetings (as agreed by the Commission at its meeting in 2017) and the Working Group should, therefore, reconvene in 2021, as originally envisaged, to review progress, and recommend any required changes, with annual reporting on progress on the 'Road Map' in between.
8. In general, the Working Group recognises the value of the forum as an opportunity to exchange information on best practice in the prevention of the spread and eradication of *G. salaris*. A recommendation to all Parties and jurisdictions is that all action and contingency plans related to a putative outbreak of *G. salaris* be tested routinely to ensure their efficacy.
9. In addition, the Working Group encourages all Parties and jurisdictions to ensure that the threat of *G. salaris* is highlighted sufficiently within the new Implementation Plans, and that subsequent actions to prevent, contain and eradicate the parasite are developed. For example, when routinely monitoring populations of juvenile salmon, Parties and jurisdictions should be particularly conscious of the effects that *G. salaris* might have in significantly lowering juvenile salmon numbers. This should be taken into account when assigning a cause (s) to an unexpected decline in juvenile salmon abundance.
10. The North-East Atlantic Commission is asked to consider the recommendations in the attached report and decide on appropriate actions. If it agrees to proceed with a further meeting of the Working Group in 2021, the Terms of Reference might be as follows:
 - provide a forum for exchange of information among the Parties / jurisdictions on research on, and monitoring, control and eradication programmes for, the parasite *G. salaris*;
 - review progress in relation to the recommendations contained in the Commission's 'Road Map' including progress with the development and testing of contingency plans;

- develop recommendations for enhanced co-operation on measures to prevent the further spread of the parasite and for its eradication in areas where it has been introduced.

Haakon Hansen
Working Group Chairman

Emma Hatfield
Secretary

Edinburgh
11 May 2018

GSWG(18)13

Report of the Meeting of the Working Group on Gyrodactylus salaris in the North-East Atlantic Commission Area

NASCO Headquarters, Rutland Square, Edinburgh, UK

25 and 26 April 2018

1. Opening of the Meeting

- 1.1 The Chairman, Dr Haakon Hansen (Norway), opened the meeting and welcomed participants to Edinburgh. He invited brief introductions from all participants and explained how he expected the meeting to run.
- 1.2 A list of participants is contained in Annex 1.

2. Adoption of the Agenda

- 2.1 The Working Group adopted its Agenda, GSWG(18)10 (Annex 2).

3. Consideration of the Terms of Reference

- 3.1 The Working Group considered its Terms of Reference as agreed by the North-East Atlantic Commission, GSWG(18)02. These request that the Working Group undertake the following tasks:
 - provide a forum for exchange of information among the Parties / jurisdictions on research on, and monitoring, control and eradication programmes for, the parasite *G. salaris*;
 - consider the need for revisions to the recommendations in Annex 12 of NEA(17)4 to ensure consistency with NASCO Parties' Animal Health Legislation;
 - develop recommendations for enhanced co-operation on measures to prevent the further spread of the parasite and for its eradication in areas where it has been introduced.
- 3.2 The Chairman advised the Working Group that it was not possible to make changes to the ToRs and that its recommendations will be considered by the North-East Atlantic Commission of NASCO at its Thirty-Fifth (2018) Annual Meeting in Portland, USA in June.
- 3.3 In preparation for the meeting, each Party / jurisdiction had been asked to prepare a brief paper updating the reports that were made at the Working Group's 2017 Meeting on Agenda items 4, 5 and 6. The following reports were received and distributed to all participants:
 - GSWG(18)03 - Briefing Paper on *Gyrodactylus salaris* (tabled by EU - UK (England and Wales)). (Annex 3);

- GSWG(18)04 - *Gyrodactylus salaris* Update Paper - contribution from EU - Finland. (Annex 4);
- GSWG(18)05 - Detailed Report on Agenda Items 5 and 6 from Norway. (Annex 5);
- GSWG(18)06 - Report from EU - Sweden to the 2018 *Gyrodactylus salaris* Working Group. (Annex 6);
- GSWG(18)07 - *Gyrodactylus salaris* Update Paper from EU – Denmark. (Annex 7);
- GSWG(18)08 - *Gyrodactylus salaris* Update Paper – contribution from EU - UK (Scotland). (Annex 8);
- GSWG(18)09 - *Gyrodactylus salaris* Monitoring Update from EU - UK (Northern Ireland). (Annex 9)
- GSWG(18)11 - Irish Briefing Paper on *Gyrodactylus salaris* (Tabled by EU (Ireland)). (Annex 10)

4. On-going and Planned Research Concerning *G. salaris*

- 4.1 The Chairman invited presentations from the Working Group participants and two presentations were made.

Norway

- 4.2 Norwegian research from the Norwegian Veterinary Institute (NVI) was presented by the Chairman, Dr Haakon Hansen. The NVI has a long history of research on *G. salaris* and is currently carrying out research on several different aspects relating to it, through five main projects.
- 4.3 eDNA detection of *G. salaris* and its main hosts: using water filtering and digital droplet PCR (ddPCR) analysis, researchers at the NVI have shown that both *G. salaris* and its two main hosts, Atlantic salmon (*Salmo salar*) and rainbow trout (*Oncorhynchus mykiss*), can be detected in water samples using these techniques. This work will be published in the near future and further work on this matter is ongoing. The use of eDNA is seen as a promising and sensitive method that can be used in surveillance programs for *G. salaris* as well as for research.
- 4.4 Genetic mechanisms behind resistance against *G. salaris*: it is well known from previous infection trials that Baltic salmon originating from the River Neva is resistant to *G. salaris* and is able to control infections, while Atlantic salmon populations show little or no resistance to the parasite. However, the mechanisms behind this response is unknown. In an ongoing project, researchers at the NVI have carried out a controlled aquarium infection trial with *G. salaris* on a resistant Neva population and a non-resistant Atlantic salmon population. Samples from the experimental fish are currently being analysed using RNA-sequencing to begin to understand the mechanisms of resistance to *G. salaris* infection.
- 4.5 *Gyrodactylus* parasites in the Russian north: there have been recent reports on infections with *G. salaris* in the previously uninfected rivers Pak and Shovna in the north of Russia (Murmansk region) and there is thus increased interest and focus on this parasite in this area. An agreement on the exchange of biological material and research collaboration

was signed in March 2018 by NVI and Institute of Biology KarRC RAS, Petrozavodsk. This agreement will be the basis for further collaboration in research. The NVI, as the World Organisation for Animal Health (OIE) reference laboratory for *G. salaris*, will receive samples and be able to confirm and report on the recent suspected infections of *G. salaris*. Additionally, a collaborative project is planned that will study the distribution of *G. salaris* and other *Gyrodactylus* species in the north of Russia. This will include field work with sampling of fish as well as eDNA detection of *G. salaris* and rainbow trout. The project and collaboration will give important knowledge for the authorities in Russia, Norway, Finland and Sweden.

- 4.6 New markers for strain characterisation and species identification using comparative genomics: given the current inability to differ between *G. salaris* and *G. thymalli* and between pathogenic and non-pathogenic strains of *G. salaris* it is important to develop new markers for this purpose. In a collaboration with the University of Graz, Austria, several genomes, representing different populations of *G. salaris* and *G. thymalli*, will be sequenced and compared to search for suitable markers.
- 4.7 The current distribution of *G. salaris* in European countries: through broad collaboration, a review paper is in preparation that will give an overview of the present distribution of *G. salaris* throughout Europe. In this paper all reports of *G. salaris* from the different European countries will be reviewed together with the analysis of new samples obtained from several countries. This work will be submitted for publication shortly.
- 4.8 A presentation of Norwegian research from the Norwegian Institute for Nature Research concerning eradication and spread of *G. salaris* was given. Aluminium sulphate was used in the River Lærdalselva in 2011 and 2012, and after five years of surveillance, examining 2155 salmon parr, the river was declared free from the parasite in 2017. As part of an ongoing laboratory and field project, the chemical chloramine was added to a small river at concentrations of $35\mu\text{g l}^{-1}$ (i.e. at a concentration of chlorine lower than would be found in drinking water) to study its potential as a candidate for eradication of *G. salaris* without killing other fauna. The results are very promising; the parasite disappeared several hundred meters downstream of the point where the chloramine was added and no significant negative effects to salmon parr or invertebrates were observed. In the River Driva, a large fish migration barrier has been built that will isolate the upper reaches of the river, resulting in the eventual disappearance of salmon parr and *G. salaris*, but not brown trout and *G. derjavinoides* (a species commonly found on brown trout). Upstream of the barrier electrofishing and the use of eDNA will be used to monitor the expected population decline in the salmon, and hence *G. salaris*. It is feared that movement of infected salmonids from the River Drammen through the Oslo Fjord may spread *G. salaris* as low salinity has been measured periodically in the surface waters of the Oslo Fjord. The project 'Gyrofree' models the yearly salinity variation in the Oslo Fjord and uses telemetry to study the migration of tagged salmonids.

5. **Exchange of information on monitoring and control programmes for *G. salaris*, and updates on its distribution**

European Union - UK (England and Wales)

- 5.1 The Cefas fish health inspectorate (FHI) carries out sampling of species susceptible to *G. salaris* to maintain skills and experience in relevant techniques. Due to the low number

of salmon farms in England and Wales, samples are obtained from wild salmonid populations. This work is carried out in conjunction with the Environment Agency's area fisheries teams during their annual wild fish population surveys. The Cefas FHI carries out monitoring for *G. salaris* in England and Wales through a rolling programme of sampling covering all river catchment's which contain salmon. Within England and Wales, there are seventy-eight rivers that support salmon, although not all currently host large populations. Each of the catchments is sampled approximately every five years where possible. The fish sampled are usually parr, of up to 15 cm in length, and a total of 30 fish are sampled where possible. Generally, a sample of 30 salmon are taken, but where the numbers of salmon are too low to obtain this sample size, trout and grayling may be taken as a substitute. Based on the 2017 sampling, the European Union - UK (England and Wales) remains free of *G. salaris*.

European Union - Finland

- 5.2 The results of monitoring in 2017 in the catchments of rivers in Finland draining into the Barents Sea have been negative for *G. salaris*. The rivers Tenojoki and Näätämöjoki both have free status for *G. salaris*. There is only one fish farm in the River Paatsjoki catchment. In other water catchments running into the Barents Sea there has not been fish farming activity during 2017. In 2017 there were difficulties in performing the fishing to get samples and the numbers of the examined fish are lower than previously.

Norway

- 5.3 National surveillance programme: in 2017, 9 new rivers in the Vefsna region and the River Lærdal were declared free of *G. salaris* after treatment. That means 10 more rivers will be added to the surveillance programme for sampling.
- In 2017: 69 rivers were selected for sampling of 2,217 fish.
 - 3,615 fish from hatcheries and farms were sampled. No findings of *G. salaris*.
 - In 2018, 75 rivers are selected for sampling; the plan is to sample 2,370 fish.
 - 3,960 fish from hatcheries and farms are planned to be sampled
- 5.4 Epidemiological surveillance in the River Rana: 951 fish were analysed from two lakes. So far all samples are negative to *G. salaris*, and the surveillance programme will be finished in 2018.
- 5.5 The post treatment surveillance programme continues in 4 regions. If *G. salaris* is not found after 5 consecutive years of surveillance, the rivers will be declared free from this parasite.

European Union - Sweden

- 5.6 The distribution of *G. salaris* on the Swedish west coast was reported to the Working Group in 2017 (GSWG(17)15). However, in the same year another river (River Kungsbackaån) was found to be infected with *G. salaris*. This river emanates in the sea only 1 km from the mouth of River Rolfsån where *G. salaris* was detected in 2016. The sea area is a shallow fjord with a mixture of saline (max 25 ‰) and brackish water (ca 15 ‰), enabling the natural spread of the parasite through the movement of salmonid fish.

- 5.7 This means that all (n=16) salmon rivers on the Swedish west coast in the Kattegatt Sea area now have *G. salaris*. Rivers (n=7) emptying into Skagerrak Sea (north of a line between Göteborg and the tip of Jutland in Denmark) are free from the parasite, although occasionally *G. derjavinoidea* is found. The salinity of the surface layer in Kattegatt is 18 – 26 ‰, whereas it averages 30 ‰ in Skagerrak. It is unknown how long the parasite has been present in the salmon rivers on the Swedish west coast. It was found in fish farms in 1974-1989 in the area (Rivers Göta älv, Lagan, Kungsbackaån) and its further spread has been suggested to depend mainly on the legal stocking of reared salmon smolt and illegal stocking of rainbow trout.
- 5.8 On the west coast the closest known occurrence of *G. salaris* to Norway is in Göta älv (Grönån), 107 km from the Norwegian border, and in Lake Vänern circa 200 km from Norway. In northern Sweden the distance between known occurrence of *G. salaris* and the Norwegian border is 52 km in River Torniojokki (Lainioälven).
- 5.9 Co-operation with Norwegian scientists has been carried out in risk analyses of a spread of *G. salaris* from Sweden to Norway. It was concluded that allowing land-locked salmon from Lake Vänern to migrate past the eleven man-made obstacles (power plants on the River Klarälven / Trysilälva) into Norway would risk spreading the parasite. The risk of spread of *G. salaris* from rivers in northern Sweden (and Finland and Russia) to Norway has also been evaluated. It was concluded that illegal stocking of fish was the most important threat, whereas migration of wild fish, fishing gear or use of live bait were less probable risk factors. Information to the general public considered to be an important countermeasure to mitigate the risk.

European Union - Denmark

- 5.10 At present there are no plans for monitoring and control programmes for *G. salaris* in Denmark.

European Union -UK (Scotland)

- 5.11 As part of the Great Britain health zone, Scotland remains certified free from the presence of the parasite *G. salaris*. Risk based, passive and intelligence-led surveillance initiatives undertaken by Marine Scotland Science remain in place together with diagnostic capacity as measures to detect the parasite should it be introduced. No evidence of *G. salaris* was detected through samples taken in Scotland during 2017.

European Union - UK (Northern Ireland)

- 5.12 *G. salaris* monitoring is carried out as part of the Department of Agriculture, Environment and Rural Affairs (DAERA) Fish Health's disease testing regime. A rolling regime of testing takes place across both operational fin fish farms and wild catchment areas (by electrofishing). This equates to between 10 – 12 sites each for both farmed and wild stock areas being monitored each year. The testing work is carried out by Agri-Food & Biosciences Institute on DAERA's behalf as a part of their Annual Work Program and the Service Level Agreement with the Fish Health section. In 2017 no *G. salaris* was detected and European Union - UK (Northern Ireland) remains disease free.

European Union - Ireland

- 5.13 Since 2005, wild salmon parr from selected river systems are examined annually for the presence of *G. salaris* in Ireland. This monitoring is undertaken in conjunction with the catchment-wide electrofishing programme managed by Inland Fisheries Ireland (IFI) with sample analyses undertaken by Fish Health Unit (FHU) of the Marine Institute (MI). Further to this, the MI are responsible for investigating unexplained abnormal or significant fish mortalities encountered in Ireland which may be a result of fish disease.

Russian Federation

- 5.14 Although there was no paper submitted for the Russian Federation, the NASCO Secretary reported to the Group that the Annual Progress Report (APR) for Actions taken in 2017 for the Russian Federation (CNL(18)26) indicated that there had been an introduction of the parasite *G. salaris* to the Rivers Pak and Shovna in the basin of the Lower Tuloma Reservoir (Murmansk region) in 2017. It is believed that the introduction of the parasite was caused by transfers of rainbow trout to the cage-aquaculture farms in the reservoir.
- 5.15 The APR further indicated that measures to prevent the spread of *G. salaris* were undertaken under the veterinary regulations for live fish, eggs and crayfish transfers which came in force by the order of the Ministry of Agriculture of USSR, 31.05.1971. Any live fish, eggs and crayfish transfers require permission from the Chief State Veterinary Inspector. In 2017 the Anti-Epizootic Commission of the Murmansk region restricted live fish transfers from the region of Leningrad and from Republic of Karelia into the Murmansk region. The Commission made recommendations to ban the development of new aquaculture sites in the Lower Tuloma Reservoir.

- 6. Update on enhanced co-operation on measures to prevent the further spread of the parasite and to eradicate it where it has been introduced including:**
- (i) international initiatives; and**
 - (ii) national and regional initiatives**

European Union - UK (England and Wales)

- 6.1 A representative of Cefas presented information on the contingency planning for *G. salaris* in England and Wales. The UK has a *G. salaris*-free status and the parasite is listed in the Aquatic Animal Health Regulations (England and Wales, 2009). A generic framework contingency plan sets out the approach to be taken for an emergency response to detection of a listed exotic aquatic animal disease. Annexes to the plan contain disease specific information on sampling, diagnostics, disinfection, etc. On suspicion of a listed disease, a meeting is held with the Chief Veterinary Officer (CVO) and others. The contingency plan is launched if the CVO considers that the detection of the pathogen meets criteria for a case definition (as defined in the OIE manual). A National Disease Control Centre is established at Weymouth. A policy group operates from Defra headquarters and an expert group operates from Weymouth. Regular meetings are held to which all interested parties are invited (including stakeholders). The key objectives of the plan are to prevent further spread of the parasite and, if possible, to attempt eradication. Control measures are implemented on a catchment basis. In England and Wales, *G. salaris*, if introduced, might spread without detection for weeks or months through the movement of live salmonids, mainly rainbow trout. Under these

circumstances, by the time that it is detected, it may be geographically widespread. On this basis it has been agreed that a standstill of movements of susceptible species (rainbow and brown trout and salmon) is needed until the distribution has been determined. This action has negative economic consequences for salmonid fish farms and fisheries. It is, therefore, important that surveillance is undertaken to determine the geographic distribution of the parasite, and thus allow farms in catchments free of *G. salaris* to resume trade as soon as possible. Contingency plans include guidance on the design of a surveillance programme (of both farmed trout and wild Atlantic salmon). Surveillance would be undertaken with the co-operation of the Environment Agency and Natural Resources Wales. Powers exist to put in place restrictions on recreational activities in infected catchments which may increase the risk of spread. England and Wales do not have immediate access to rotenone nor does it plan for a rapid deployment of rotenone to prevent spread of the parasite. The potential for eradication of the parasite would be considered on a catchment by catchment basis. Eradication methods (e.g. aluminium sulphate and chloramine) currently under development, which do not destroy all fish and invertebrates, would increase the likelihood that eradication would be attempted. It is clear that whilst *G. salaris* is a very serious threat to wild Atlantic salmon, it does not cause direct losses to farmed salmonids. However, plans to limit the spread of *G. salaris* would cause short term economic costs at a national level to the rainbow trout industry (both farms and fisheries) due to restrictions on live fish movements in the early stages of an outbreak. In the longer term, restrictions on farming in rivers where *G. salaris* has been detected may result in long term economic losses. Contingency plans are kept under continual review and are subject to periodic testing in collaboration with devolved administrations.

Norway

- 6.2 A representative of the Norwegian Food Safety Authority (NFSA) presented progress on the development of their contingency plan. Since the last meeting Norway has developed a draft contingency plan and the groups and strategies needed to deliver and implement it. In the event of an incident, they will collaborate extensively with the Norwegian Veterinary Institute (NVI), the Norwegian Environment Agency (NEA) and the County Governor (CG). Therefore, interactions with them are part of the plan, but these other parties also have their own plans.
- 6.3 NFSA's plans, check lists and templates follow the main structure for contingency planning, to identify who will do what, when and how. They are developed and maintained in the contingency planning and incident management system 'MatCIM'. This application helps the most relevant co-workers in NFSA to do the right things quickly and in a correct way. Additionally, publicity, communication and using the media are important parts of the contingency plan. NFSA will update a variety of posters, in different languages, to inform recreational river users given the potentially devastating impacts of this parasite on wild salmon stocks if introduced.
- 6.4 The legal bases underpinning the plan are: The Food Act: Article 19; The Animal Welfare Act. Article 3; Regulation for Fish Diseases, Articles 42, 44, 45 and 48. There are also specific regulations for protection zones.
- 6.5 Routines have been established for exercising general contingency and under types of scenarios. There are a number of inter-institutional groups. The 'National Coordination

Group' is the Disease Strategy Group, comprising members from both NFSA and NEA, and it coordinates NVI, the County Governor, and other organizations, both regional and local. Additionally, NFSA uses NVI as their Expert Scientific Group who verify the diagnoses, provide advice and form an action group to perform treatment.

- 6.6 Since the last Working Group meeting, NSFA, together with NEA, have attended 3 meetings with Russian, Swedish and Finnish authorities and more meetings are planned. Norway wishes to continue and even extend the scope of dialogue about *G. salaris* with its neighbours.
- 6.7 A representative of the NEA presented information on their *G. salaris* eradication programme in Norway. The parasite has been treated and eradicated in 32 rivers; 11 rivers in 4 regions have undergone treatment but are not yet declared disease-free and 7 rivers are still known to be infected. A new action plan is being prepared in 2018 that will address the following issues: the need for new fish barriers or closing of existing fish ladders; contingency planning / emergency response for treated rivers not declared free of *G. salaris*; the need for the preservation of fish stocks in the two remaining regions infected with *G. salaris* (the conservation plan for these fish depends on the method to be used for combatting *G. salaris* infection); combatting the parasite in the two remaining regions, with decisions to be made on the treatment to use, i.e. rotenone, aluminium sulphate or chloramine.

European Union -UK (Scotland)

- 6.8 A representative from Marine Scotland Science presented their measures taken to prevent the introduction of *G. salaris* and its eradication should an introduction occur.
- 6.9 International initiatives: trade restrictions granted through EU Commission Decision 2010/221 are in place and assist in preventing the import of *G. salaris* into the UK through commercial activity involving the trade in live aquatic animals.
- 6.10 National and regional initiatives: during 2017 the Scottish Government continued its 'Home & Dry' campaign to help publicise the risks associated with *G. salaris* and the mitigation measures which can be implemented in relation to angling and water sports. The Scottish Government has developed and maintains generic contingency plans to deal with outbreaks of listed diseases in accordance with Council Directive 2006/88/EC.
- 6.11 In the event of an outbreak, operational and strategic responses will be undertaken by Marine Scotland with a view to containing and eradicating disease where possible. In recognition of the additional challenges posed by *G. salaris*, in terms of the potential impacts on wild fish, discrete contingency plans have been developed to deal with an outbreak of the parasite in Scotland. Part of the contingency procedure recognises the extensive expertise and experiences within Norway in terms of containing and eradicating the parasite. Agreements have been established to utilise this expertise should the need arise.
- 6.12 Scottish Contingency plans for *G. salaris* are currently in their 4th edition and were last revised in March 2011. The need for further update and revision is recognised. Contingency procedures are subjected to regular testing in co-operation with devolved

administrations and will be revised in the light of lessons learned from joint contingency exercises.

European Union - UK (Northern Ireland)

- 6.13 DAERA has been part of new UK initiative to prevent the spread of invasive species by raising awareness and a targeted campaign has been launched advising anglers of the steps needed to be taken to prevent their spread. Work is ongoing to update the Northern Irish and cross-border contingency plans for *G. salaris*.

European Union - Ireland

- 6.14 A detailed contingency plan for dealing with any outbreak of *G. salaris* in Ireland has been completed in 2017 by the Fish Health Unit of the Marine Institute (FHU) with input from Inland Fisheries Ireland (IFI) and other stakeholders with statutory interests in salmonids. The plan was forwarded to NASCO in advance of the 2018 *G. salaris* Working Group meeting.
- 6.15 The plan sets out in detail the operational responsibilities and actions to be taken in the event of a suspected occurrence of *G. salaris*. This includes the following:
- the convening of the National Disease Strategy Group (NDSG) to activate and oversee the implementation of the contingency plan. The group will comprise senior representatives from relevant Government Departments and State Bodies as well as expert national and international veterinary scientists;
 - the establishment of a National Control Centre (NCC) overseen by the NDSG for the purposes of co-ordinating control / eradication measures. The NCC will include representatives of the FHU, Inland Fisheries Ireland, Departmental veterinary inspectors, the cross-border Loughs Agency and relevant representation from Northern Ireland;
 - a communications strategy;
 - detailed actions to be implemented on the suspicion or confirmation of an occurrence of *G. salaris*;
 - sampling, testing and fish disposal protocols;
 - containment, eradication and treatment options.

- 6.16 In a broad discussion of the various issues raised under this agenda item, the Working Group recognised the value of the forum as an opportunity to exchange information on best practice in the prevention of the spread and eradication of *G. salaris*. A recommendation to all Parties and jurisdictions is that all action and contingency plans related to a putative outbreak of *G. salaris* be tested routinely to ensure their efficacy.

7. Consideration of the recommendations in Annex 12 of NEA(17)4 to ensure consistency with NASCO Parties' Animal Health Legislation

- 7.1 At its 2017 Meeting, the Working Group had noted that when the 'Road Map' was developed in 2004 and updated in 2006, there had been considerable uncertainty about new EU fish health legislation which was under review at that time. Many of the

recommendations for revisions to international guidelines contained in the 2006 ‘Road Map’ related to the replacement of EC Directive 91/67 by a new Directive, 2006/88/EC. The 2006 Directive was due to be replaced by a new Commission Regulation (2016/429) that would cover both terrestrial and aquatic animal health, but the provisions relating to aquatic animals would remain largely unchanged. The Working Group had agreed that the 2006 ‘Road Map’ could be simplified considerably to remove duplication and reflect changes in the EU aquatic animal health legislation and re-formatted without reference to the original source of the recommendations, responsibilities and timeframe for action. A revised ‘Road Map’, GSWG(17)13, was developed and the Working Group recommended that the North-East Atlantic Commission consider adopting the document given the potentially devastating impacts of this parasite on wild salmon stocks if introduced.

- 7.2 At the 2017 Annual Meeting of the North-East Atlantic Commission (the Commission), the European Union noted that it was unable to adopt the proposed revised ‘Road Map’ as there had been inadequate time to consult and it was not clear if some recommendations were consistent with EU Animal Health regulations. The Commission therefore did not adopt the revised ‘Road Map’ but agreed that at its 2018 meeting the Working Group would consider the need for revisions to the recommendations contained in that document to ensure consistency with NASCO Parties’ animal health legislation. To this end, the European Union proposed to provide comments to the Working Group in relation to the revised ‘Road Map’ ahead of the Group’s 2018 meeting.
- 7.3 Unfortunately, the European Union was not able to provide comments by the time the Working Group met and the Group therefore recommends that the revised ‘Road Map’ GSWG(17)13 should be used as the basis of best practice going forward until the Commission has agreed it formally, subject to any changes recommended by the European Union and agreed by the Commission. The Working Group is anxious to ensure that these outstanding issues are resolved as swiftly as possible, and preferably in advance of the 2018 Annual Meeting of the Commission, to enable the full adoption of the revised ‘Road Map’.
- 7.4 In addition, the Working Group recommends that the 2018 meeting should remain the first in the three-year cycle of meetings (as agreed by the Commission at its meeting in 2017) and the Working Group should, therefore, reconvene in 2021, as originally envisaged, to review progress, and recommend any required changes, with annual reporting on progress on the ‘Road Map’ in between.

8. Other Business

- 8.1 The NGO representative informed the Group of NASCO’s 5-yearly Implementation Plans and Annual Reporting cycle. It was highlighted that the third cycle of Implementation Plans will be produced by Parties and jurisdictions in 2018. After some clarification by the Secretary on NASCO’s reporting system, the Working Group encouraged all Parties and jurisdictions to ensure that the threat of *G. salaris* is highlighted sufficiently within the new Implementation Plans and subsequent actions to prevent, contain and eradicate the parasite are developed. For example, when routinely monitoring populations of juvenile salmon, Parties and jurisdictions should be particularly conscious of the effects that *G. salaris* might have in significantly lowering

juvenile salmon numbers. This should be taken into account when assigning a cause (s) to an unexpected decline in juvenile salmon abundance.

9. Report of the Meeting

9.1 The Working Group agreed a report of its meeting.

10. Close of the Meeting

10.1 The Chairman thanked all participants for their contributions, wished them a safe journey home and closed the meeting.

List of Participants

Emma Hatfield, NASCO Secretariat
Sarah Robinson, NASCO Secretariat
Haakon Hansen (Chair), Norwegian Veterinary Institute
Geir Jakobsen, Norwegian Food Safety Authority
Tor Atle Mo, Norwegian Institute for Nature Research - NINA
Edmund Peeler, CEFAS, UK
Neil Purvis, Marine Scotland (Science) Scottish Government
Jarle Steinkjer, Norwegian Environment Agency
David Stone, CEFAS, UK
Erik Degerman, Swedish University of Agricultural Sciences
Ken Whelan, Atlantic Salmon Trust, NGO

GSWG(18)10

***Meeting of the Working Group on Gyrodactylus salaris
in the North-East Atlantic Commission Area***

NASCO, Rutland Square, Edinburgh, UK

25 and 26 April 2018

Agenda

1. Opening of the Meeting
2. Adoption of the Agenda
3. Consideration of the Terms of Reference
4. On-going and planned research concerning *G. salaris*
5. Exchange of information on monitoring and control programmes for *G. salaris*, and updates on its distribution
6. Update on enhanced co-operation on measures to prevent the further spread of the parasite and to eradicate it where it has been introduced including:
 - (i) international initiatives; and
 - (ii) national and regional initiatives
7. Consideration of the recommendations in Annex 12 of NEA(17)4 to ensure consistency with NASCO Parties' Animal Health Legislation
8. Other Business
9. Report of the Meeting
10. Close of the Meeting

Secretary
Edinburgh
25 April 2018

GSWG(18)03

Briefing Paper on Gyrodactylus salaris (Tabled by EU England and Wales)**Scope**

This paper is a briefing note presented on behalf of England and Wales for the NASCO Working Group on *Gyrodactylus salaris* in the North-East Atlantic Commission Area. The paper provides country-specific details of the monitoring and control programmes currently in place.

Legislative controls

At present, the UK is recognised as being free from *G. salaris* and as such the parasite is considered exotic to the country. The UK is one of the few areas within the EU that is recognised free from the parasite along with the Republic of Ireland and two river catchments in Finland ⁽¹⁾.

Due to recognised freedom from *G. salaris*, under Council Directive 2006/88/EC, Article 43, the United Kingdom is able to restrict imports of live salmonids to countries that have an equivalent health status i.e. demonstrated freedom from *G. salaris* and are approved as such by that countries competent authority. The National controls implemented under the Aquatic Animal Health (England and Wales) Regulations 2009 mean that any suspicion of infection or mortality resulting from infection must be reported to the Fish Health Inspectorate. Failure to inform the FHI of any suspicion of *G. salaris* is an offence under the regulations.

Monitoring Programme

Cefas fish health inspectorate (FHI) carry out sampling of species susceptible to *G. salaris* to maintain sampling and diagnostic capacity, and to provide continued evidence of freedom from the parasite in England and Wales.

Due to the low number of salmon farms in England and Wales, samples are obtained from wild salmonid populations. This work is carried out in conjunction with the Environment Agency's area fisheries teams during their annual wild fish population surveys.

The Cefas FHI carries out monitoring for *G. salaris* in England and Wales through a rolling programme of sampling covering all river catchment's which contain salmon. Within England and Wales, there are seventy-eight rivers that support salmon, although not all currently host large populations. Each of the catchments is sampled approximately every five years where possible. The fish sampled are usually parr of up to 15 cm in length and a total of 30 fish are sampled where possible. Generally, a sample of 30 salmon is taken, but where the numbers of salmon are too low to obtain this sample size, trout and grayling are taken as a substitute.

Diagnostic methods***Traditional sampling approach (pre-2016)***

Once collected the fish are euthanized and placed into ethanol before being returned to the Weymouth Cefas laboratory for examination. Handling of the fish during the field sampling is kept to a minimum, to minimise the risk of removing any gyrodactylids that may be present on the fish. The sample, on return to the laboratory, is examined under a light microscope and any gyrodactylid species found are recorded and identified.

Non destructive sampling

In 2016 the Cefas FHI introduced the use of a novel non-destructive method, developed at Cefas Weymouth laboratory, for sampling wild salmonids (Figure 1). This method involves the immersion of fish in a weak hydrogen peroxide solution (560ppm for 3 minutes) which removes the gyrodactylids whilst leaving the fish unharmed. The parasites can then be recovered for analysis whilst the live fish are returned to the river. This technique has increased the number of fish sampled from each river catchment, and increased the harvest of gyrodactylids, which improves the statistical confidence in the sampling programme. This method represents an important step forward in surveillance for gyrodactylids in both wild and farmed fish populations as it removes the need for destructive testing of juvenile Atlantic salmon, a species subject to national and international conservation measures. This new technique has been incorporated into Defra's (England and Wales) national aquatic animal disease contingency plans. Cefas plans to publish the methodology and will then request that it is considered for inclusion in the OIE manual for diagnostic tests for aquatic animals.



Figure 1. Equipment used in a novel non-destructive method for sampling wild salmonids for gyrodactylids

Species identification based on morphology

Since 2007, fifty-seven sites on forty-three catchments have been sampled. In this time, *G. salaris* has not been found in any of the samples (Table 1). However, several other gyrodactylid species native to the UK have been identified.

- *Gyrodactylus derjavinoidei*: Host is brown trout but also found on rainbow trout. Parasitises fins and skin surfaces.
- *Gyrodactylus thymalli*: Host is grayling. Parasitises fins and body surfaces
- *Gyrodactylus truttae*: Host is brown trout and Atlantic salmon. Observed on fins and skin surfaces

In addition to the gyrodactylid species described above, the histologists regularly find specimens that cannot easily be identified to the species level and these are described as either 'not identified' or 'non-*Gyrodactylus salaris*' depending on the problems encountered

during the identification process. In 2016, of the 242 individual gyrodactylid samples screened by histology, 16% were described as non-*Gyrodactylus salaris* and 29% were unreadable.

Molecular speciation

In 2017 all individual gyrodactylids collected were identified by ITS sequence analysis. DNA was extracted from individual specimens in a 96 well format using the DNA investigator kit (Qiagen) BioRobot Universal according the manufacturers protocol and the DNA was eluted in a 50µl volume 2.5µl of the DNA was used in all PCR reactions. Conventional PCR was performed using the gyrodactylus specific ITS primers described in the OIE diagnostic manual. After purification using a MinElute 96 UF PCR purification kit (Qiagen), PCR products were sequenced in both directions using an ABI Prism BigDye v 3.1 Terminator Cycle Sequencing kit (Applied Biosystems) and the same primers used for the amplification. Sequence data were analysed on a ABI Prism 3500xl genetic analyser. The species were then identified by comparing the consensus sequences to published sequences on GenBank/EMBL sequence data based using the Basic Local Alignment Search Tool (BLAST).

Future Research

The Cefas Weymouth laboratory is currently evaluating a *G. salaris*-specific real-time PCR assay developed by Marine Scotland Science⁽²⁾. It is hoped that the assay can be used to detect the presence of single *G. salaris* parasites in a pooled sample and that it will be suitable to screen the large numbers of parasite anticipated when undertaking forward and backward tracing during a disease outbreak. The haplotype of any positive samples would be confirmed by amplification and sequence analysis of the COI gene.

Table 1 Species of Gyrodactylids found during FHI sampling 2007-2016

Year	Catchment	Species sampled			Gyrodactylids identified
		Atlantic salmon	grayling	brown trout	
2007	Avon		17		<i>G. thymalli</i>
	Test		12		<i>G. thymalli</i>
	Tavy	30			-ve
	Plym	30			<i>G. derjavinoidea</i>
	Inny	30			-ve
	Frome	30			<i>G. sp</i>
	Tawe	30			-ve
	Nadder	20			<i>G. derjavinoidea</i>
	Avon	15			-ve
2008	Coquet	30			-ve
	Aln			17	-ve
	Tyne	30			-ve
	Wear	30			-ve
	Test		2	1	-ve
	Itchen		30		-ve
2009	Nidd		21	71	<i>G. truttae/G. derjavinoidea</i>
	Piddle	30			<i>G. derjavinoidea</i>
	Usk	30			<i>G. derjavinoidea</i>
	Wye	30			<i>G. derjavinoidea</i>
	Severn	30			<i>G. derjavinoidea</i>
	Tees	30			-ve
	Esk	30			-ve
2010	Exe	30			<i>G. derjavinoidea/G. sp</i>
	Torridge	30			<i>G. derjavinoidea</i>
	Tywi	30			-ve
	Afan	20		10	<i>G. derjavinoidea</i>
	Lugho	28		1	-ve
	Lynher	30			<i>G. derjavinoidea</i>
2011	Camel	30			-ve
	Fowey	30			-ve
	Teign			30	-ve
	Teifi	30			<i>G. derjavinoidea</i>
	Nevern	30			<i>G. derjavinoidea</i>
	Gwaun	30			<i>G. derjavinoidea</i>
	Dee	30			<i>G. derjavinoidea</i>
	Conwy	30			<i>G. derjavinoidea</i>
	Lune	30			-ve
	Duddon	30			-ve

	Esk	30			<i>G. derjavinoides</i>
2012	Thames			30	<i>G. derjavinoides/G. sp</i>
	Thames			29	<i>G. derjavinoides/G. truttae</i>
	Avon			30	<i>G. derjavinoides</i>
	Stour			30	<i>G. derjavinoides</i>
	Taw	15		15	-ve
	Tavy	30			-ve
	Wey			30	<i>G. derjavinoides</i>
2013	Coquet	29		1	-ve
	Aln	4		26	-ve
	Piddle	1		12	-ve
	Tamar	30			-ve
	Frome	30			-ve
	Ouse			30	-ve
	Tyne	30			-ve
	Wear	30			-ve
2014	Ouse			30	<i>G. derjavinoides</i>
	Inny	30			-ve
	Plym	30			<i>G. derjavinoides</i>
	Usk	30			<i>G. derjavinoides</i>
	Wye	33			<i>G. derjavinoides</i>
	Severn	30			<i>G. derjavinoides</i>
	Test	30			-ve
2015	Itchen	30			<i>G. derjavinoides</i>
	Esk (Yorkshire)			30	<i>G. derjavinoides</i>
	Tees	30			<i>G. derjavinoides</i>
	Exe	25		5	<i>G. derjavinoides</i>
	Torridge	30			<i>G. derjavinoides</i>
	Lynher	30			<i>G. derjavinoides</i>
	Tywi	9		21	<i>G. derjavinoides</i>
	Afan	23		7	<i>G. derjavinoides</i>
	Lughor	6		24	<i>G. derjavinoides</i>
	Tawe	10		20	<i>G. derjavinoides</i>
	Tamar	6			-ve
2016	Ogmore	30			<i>G. derjavinoides</i>
	Cleddau	30			<i>G. derjavinoides</i>
	Dee	30			<i>G. derjavinoides</i>
	Mawddach	30			<i>G. derjavinoides</i>
	Fowey	30			<i>G. derjavinoides</i>
	Camel	30			<i>G. derjavinoides</i>
	Teign	30			<i>G. derjavinoides</i>
	Ellen	4		26	<i>G. derjavinoides/G. truttae</i>
	Eden	30			<i>G. derjavinoides</i>

	Bela River Kent	5		25	<i>G. derjavinoidea</i>
	Frome	30			<i>G. derjavinoidea</i>
	Usk	81		5	<i>G. derjavinoidea</i> / <i>G. truttae</i>
	Cynrig Hatchery	170			-ve
2017	Taw	23			<i>G. derjavinoidea</i> (141)
	Ure	30			
	Calder	30			<i>G. derjavinoidea</i>
	Derwent	30			<i>G. derjavinoidea</i> (10) <i>G. macronychus</i> (2) <i>G. truttae</i> (17) Unidentified (2)
	Coquet	30			<i>G. derjavinoidea</i> (7) <i>G. macronychus</i> (2) <i>G. gasterostei</i> (1) Unidentified (1)

References

1. Peeler, E.J., Thrush, M.A., 2004. Qualitative analysis of the risk of introducing *Gyrodactylus salaris* into the United Kingdom. Diseases of Aquatic Organisms. 62, 103-113
2. Collins, C.M., Kerr, R., McIntosh, R., Snow, M (2010). Development of a real-time PCR assay for the identification of *Gyrodactylus* parasites infecting salmonids in northern Europe. Diseases of Aquatic Organisms 90(2):135-42

GSWG(18)04

**Working Group on *Gyrodactylus salaris* in the North-East Atlantic Commission Area
Edinburgh, 25-26 April 2018**

European Union, Finland

Perttu Koski, Finnish Food Safety Authority Evira, Animal Disease Bacteriology and Pathology

Monitoring and control programmes for *Gyrodactylus salaris* in Finland in 2017

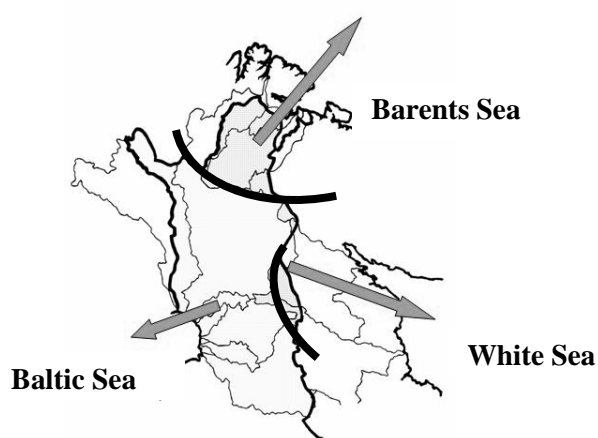


Figure 1: Three main water catchment areas in northern Finland.

The watersheds between the water catchment areas of the Barents Sea, the White Sea and the Baltic Sea are partly situated in the territory of Finland (see Fig. 1).

There is official monitoring and control programme only in the water catchment areas running into the Barents Sea in Finland.

This report includes the results of the samples taken during January 1st 2017- December 31st 2017.

Number of examined fish in the monitoring of the catchment areas running into the Barents Sea

Water catchment area	Tenojoki ¹⁾ (Tana)	Näätsjoki ¹⁾ (Neiden)	Paatsjoki ¹⁾ (Påsvik)	Paatsjoki, farmed fish		Tuulomajoki ¹⁾
Year	Salmon	Salmon	Grayling	Salmon	Char	Grayling
2017	30	120	15		60	
¹⁾ Samples from wild fish						

All the examinations have been negative for the presence of *Gyrodactylus salaris* on the examined fish.

There is only one fish farm in the River Paatsjoki catchment. In other water catchments running into the Barents Sea there has not been fish farming activity during 2017. In 2017 there were difficulties in performing the fishing to get samples and the numbers of the examined fish are lower than previously.

Measures to prevent the spread of the parasite and to eradicate it where it has been introduced

There has not been changes in the control programmes of *Gyrodactylus salaris* in 2017 in Finland.

GSWG(18)05

Detailed report on Agenda Item 5 and 6.**Working Group on *Gyrodactylus salaris* in the North-East Atlantic Commission Area
Edinburgh, April 2018.**

Geir Jakobsen, Norwegian Food Safety Authority, Fish Health and Welfare Section

Exchange of information on monitoring and control programmes for *G. salaris*, and updates on its distribution.

On the WG-meeting in March 2017, I gave a presentation on the Norwegian monitoring and control programme, done by the Norwegian Food Safety Authority (NFSA) and Veterinary Institute (NVI).

See also report, number 4.13. Here is a short recapitulation:

- a) National surveillance programme, containing
 - inspections and sampling in all hatcheries for both commercial fish farming and restocking of rivers, and also on-growing fish farms in freshwater.
 - a risk based sampling in selected rivers.
- b) Epidemiological surveillance
- c) Post treatment programme

The surveillance programmes give Norway international guarantees due to “EFTA Surveillance Authority decision No 58/16/COL-D of 3 March 2016”, which says:

- Norway can establish disease-free zones and additional guarantees for *Gyrodactylus salaris* for Norway
- Norway may require additional guarantees for consignments of live aquaculture fish of susceptible species intended for farming, which are to be introduced to the zones affected by the Decision. Those additional guarantees consist of the requirement that those consignments must originate from an area with equivalent health status as the place of destination.

Updating:

National surveillance programme. Later in 2017, 10 new rivers were declared free of *G. salaris* after treatment. That means 10 more rivers to be put into the surveillance programme for sampling.

- In 2017: 69 rivers were selected for sampling of 2,217 fish.
3,615 fish from hatcheries and farms were sampled. No findings of *G. salaris*.
- In 2018, 75 rivers are selected for sampling, the plan is to sample 2,370 fish.
3,960 fish from hatcheries and farms are planned to be sampled

Epidemiological surveillance programme in the river Rana: 951 fish analysed from two lakes. So far all samples are negative to G.s., and the surveillance programme will be finished in 2018.

Post treatment surveillance programme is going on in 4 regions, and if *G. salaris* is not found after 5 executive years, the programmes will be finished and the rivers declared free from this parasite.

Table 1. Number of rivers, farms and fish examined for *Gyrodactylus salaris* in 2017.

County	Rivers				Farms			
	No.	Fish*	No. of fish examined	Positive	No.	Fish*	No. of fish examined	Positive
Finnmark	9	AS	412	0	1	AS	30	0
Troms	4	AS	136	0	5	AS	150	0
Nordland	8	AS	242	0	11	AS	334	0
Nord-Trøndelag	6	AS	189	0	7	AS	208	0
Sør-Trøndelag	4	AS	122	0	12	AS/RT	395	0
Møre og Romsdal	15	AS	405	0	25	AS/RT	814	0
Sogn og Fjordane	4	AS	125	0	11	AS/RT	435	0
Hordaland	1	AS	31	0	22	AS/RT	709	0
Rogaland	3	AS	108	0	8	AS	304	0
Vest-Agder	4	AS	76	0	0	-	-	-
Aust-Agder	0	-	-	-	0	-	-	-
Telemark	0	-	-	-	2	AS	62	0
Vestfold	2	AS	72	0	0	-	-	-
Buskerud	2	AS	70	0	2	AS	64	0
Oppland	0	-	-	-	3	RT	80	0
Oslo	2	AS	71	0	0	-	-	-
Akershus	3	AS	109	0	0	-	-	-
Østfold	2	AS	49	0	1	AS	30	0
Total	69		2 217	0	110		3 615	0

* AS = Atlantic salmon, RT = rainbow trout.

Update on enhanced co-operation on measures to prevent the further spread of the parasite and to eradicate it where it has been introduced including international, national and regional initiatives.

Main points in report from the last meeting (4.18 and Annex 12) are:

Contingency plans are on different stages of development in different countries. Contingency plans should be made available through the Secretariat and countries without plans should be encouraged to develop them as a matter of urgency. The elements to be included in contingency plans are: Investigations, legal basis, restrictions, publicity, updating of the plan, Disease Strategy Group, and Expert Scientific Group. In short: The contingency plans should say something about “WHO will do WHAT, WHEN and HOW”.

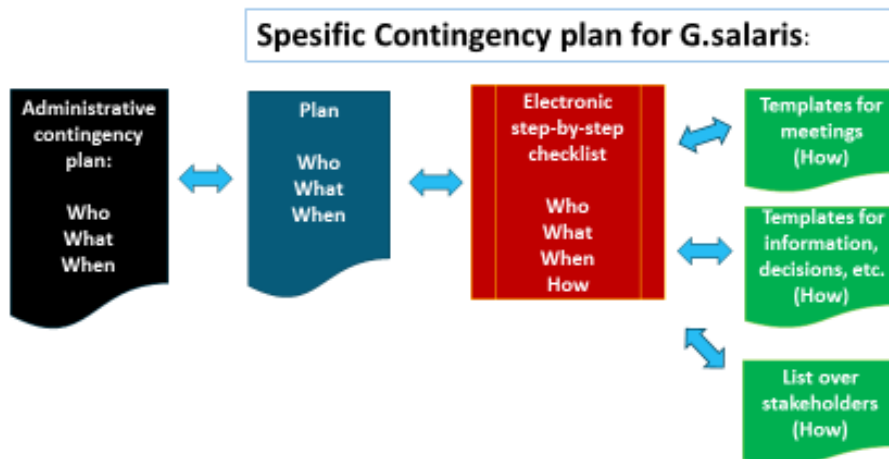
Council Directive 2006/88/EC has similar guidelines in Annex VII: «Criteria and requirements for contingency plans».

NFSA's contingency plans.

NFSA has now made a draft for further developing of our contingency plans since the last meeting. In an incident, we will collaborate extensively with the Norwegian Veterinary Institute (NVI), the Norwegian Environment Agency (NEA) and the County Governor (CG). Therefore, interactions with them are part of the plan, but these other parties also have their own plans.

The plans for *G. salaris* follow the main structure of our contingency system:

WHO will do WHAT WHEN and HOW



The Administrative Contingency Plan provides the framework and

- descriptions of the incident management organization, basic principles, roles, and responsibilities of the respective parts of the organization.
- requirements for cooperation with other government agencies, industries, other interested parties, national or international.

The Specific Contingency plan is based on the ACP and describes the particular way in which to act upon an introduction to *G. salaris*.

Parts of this plan are used in an operational electronic check list. It contains several steps, many which contain links to templates for meetings, press releases, decisions etc.

The plans, check lists and templates are developed and maintained in the contingency planning and incident management system MatCIM. This application helps the most relevant co-workers in NFSA to do the right things quickly and in a correct way.

Legal basis

- The food Act: § 19 says: *“Everybody has to be careful, so that there will be no risk for diseases to arise, develop or spread. Live animals shall not be placed on the market, brought into a holding, moved or released if there is reason to suspect the presence of a serious transmissible animal disease that may have substantial social impacts.”*
- The animal welfare Act. § 3 says: *“Animals shall be treated well and be protected from danger of unnecessary stress and strains.”*
- Regulation for fish diseases.
Due to this regulation, *G. salaris* is a list 3 disease.

Moreover, the regulation

- § 44 prohibits moving aquatic animals or aquatic organism, including carrier species, between watercourses or parts of a watercourse, even in locations where there has never been detected any pathogens

- § 45 says that fishing gear, boats and other objects used in a watercourse shall be dried and disinfected before they are moved to another watercourse or to other parts of the same watercourse, even in locations where there has never been detected any pathogens
 - § 42 provides NFSA the authority to make decisions about fish abattoirs and what to do with fish carcasses
 - § 48 provides NFSA the authority to make decisions about starting treatment with certain chemicals, remove and destruct fish, make specific regulations for protection zones etc. This Article is the basis for quick actions in order to limit the impact of *G. salaris* to a small area, avoiding the need of treatment of an entire river.
- Specific regulations for protection zones. NFSA has made such regulations for 6 regions with *G. salaris*. the past few years. These regulations sharpens the requirements in the regulation for fish diseases.

Publicity.

Communication and using the media is an important part of our contingency plan.

Especially for incidents with *G. salaris*, it is valuable to reach everybody that can do harm, not only the relevant aquaculture farms. This includes fishermen, canoeists and other people who use the nature in different ways. The plan says what time and how we should publish. MatCIM contains templates for messages. We will use the map-system “Barentswatch” to inform people about which rivers are infected.

Moreover, our websites have different brochures and posters in many different languages, as well as videos explaining the severity of an introduction with *G. salaris*, and what to do to protect the fish.

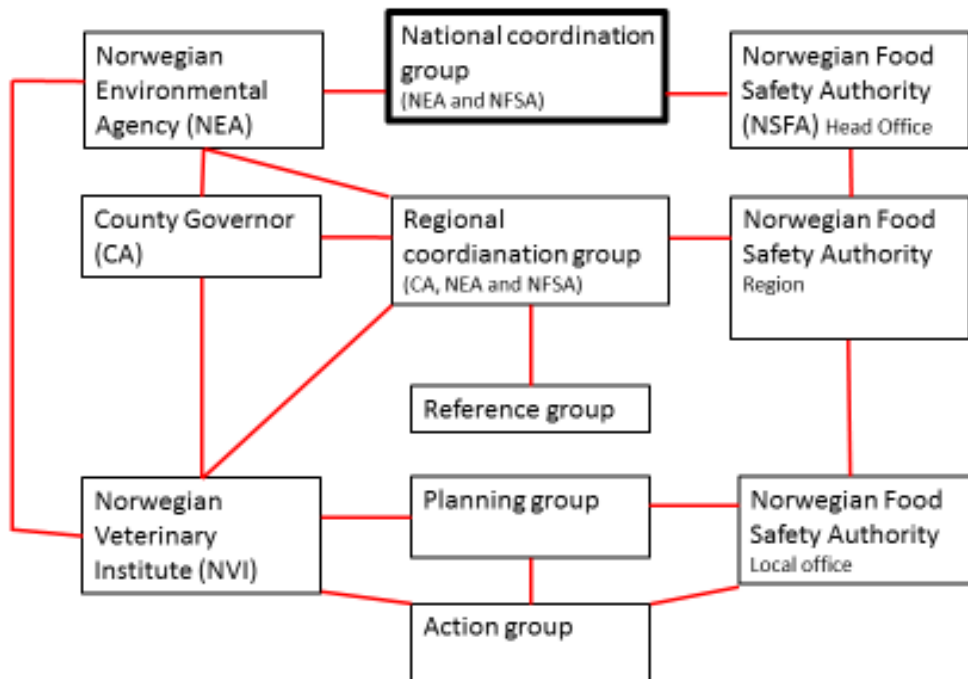
Just now, we are updating these documents with the new situation in Norway.

Annually updating of the plans.

Until now, because we have had such a high number of *G. salaris* incidents we have often looked upon coping with them as ordinary public administration. Now, with most of our rivers declared free from *G. salaris*, we must focus more on updating our contingency plans. The draft for our new contingency plans is such an updating. Now, we have established routines for exercising general contingency and types of scenarios.

Disease Strategy Group

“National coordination group” is our Disease Strategy Group. It consists of members from both NFSA and NEA, and it coordinates NVI, County Governor, and other organizations, both regional and local.



Expert Scientific Group

NFSA uses NVI as our Expert Scientific Group. They verify the diagnoses, give us advice, and make an action group for treatment.

International initiatives.

Since 1975 and until today, 50 rivers in Norway have been infected with *G. salaris*. Luckily, the combatting of *G. salaris* has been successful: Now, we have only 7 rivers left that still has not been treated with chemicals. The Norwegian Atlantic Salmon are extremely sensitive to *G. salaris*, and we have experienced severe losses in our rivers. We have combatted the parasite for over 40 years, it has been expensive, and we do not want any reinfections. We want to continue and even extend the scope of dialogue with our neighbor countries.

NFSA plans to collaborate even more with Russian Veterinary Authorities in Murmansk. So far, we have had meetings with representatives for both public authorities and academia from Norway, Russia and Finland in Murmansk 5-6.4.2017 and in Kirkenes 24-25.1.2018. A new meeting with Russia and other countries is planned in September 2018.

NFSA also want to collaborate even more with Sweden.

NFSA, NEA and CA had a meeting with Swedish authorities and academia in Gothenburgh 11.12.2017.

Relevant issues for further dialogue is *G. salaris* in rivers at the Swedish west coast and in Torneälven/Tornionjoki.

Bergen, 20.4.18

Geir Jakobsen.

GSWG(18)06

Report from Sweden to *Gyrodactylus salaris* Working Group (GSWG), NASCO, Edinburgh 25-26 April 2018

Erik Degerman¹, Sofia Brockmark², Håkan Carlstrand²

¹Swedish Univ. of agricultural sciences, Dept. of Aquatic resources, Inst. of freshwater research.

²Swedish Agency for Marine and Water Management.

Monitoring programme and updates on distribution

G. salaris is endemic to the Baltic Sea area, including rivers on the Swedish east and south coast. In 2001 a monitoring program was established for the Swedish west coast, following the detection of the parasite in wild salmon populations (1989-1997). Today monitoring is carried out in selected infected rivers to follow the development of *G. salaris* and in all but one (where the salmon population is lost due to hydropower) uninfected salmon rivers.

The field procedures were described in the presentation in 2017 to the working group (GSWG(17)15). Only the dorsal fin and both the pectoral fins are screened. Sampling is carried out at water temperatures of approximately 10 °C in April/May and October. Generally all *Gyrodactylus* specimens found in infected rivers are counted as *G. salaris*, whereas all found *Gyrodactylus spp.* in uninfected rivers are sent to the Norwegian National Veterinary Institute for species identification and genetic characterization. All data are stored in the Gyro-monitoring database of the Swedish University of Agricultural Sciences (SLU).

The distribution of *G. salaris* on the west coast was reported to GSWG in 2017 (GSWG(17)15). However, in the same year another river (R. Kungsbackaån) was found to be infected with *G. salaris*. This river emanates in the sea only 1 km from the mouth of River Rolfsån where *G. salaris* was detected in 2016. The sea area is a shallow fjord with a mixture of saline (max 25 psu, ‰) and brackish water (ca 15 psu) enabling the spread of the parasite.

This means that all (n=16) salmon rivers on the Swedish west coast in the Kattegatt Sea area now has *G. salaris* (Figure 1). Rivers (n=7) emptying into Skagerrak Sea (north of a line between Göteborg and the tip of Jutland in Denmark) are free from the parasite, although occasionally *G. derjavinoides* is found. The salinity of the surface layer in Kattegatt is 18 – 26 psu, whereas it averages 30 psu in Skagerrak.

Some of the rivers on the west coast were monitored before the start (2001) of the monitoring programme and *G. salaris* was detected before 2001 in ten rivers (Table 1). How long the parasite has been present here is not known. It was found in fish farms already in 1974-1989 in the area (rivers Göta älv, Lagan, Kungsbackaån). The further spread has been suggested to mainly depend on stocking of reared salmon smolt.

In a few rivers the monitoring started before the first confirmed occurrence of *G. salaris* (Table 1). Especially in River Himleån (nr 11 in the table), River Rolfsån (nr 14) and River

Kungsbackaån (nr 15) there are reliable data on a recent spread. Also River Löftaån (nr 13) may have a recent spread. All these rivers are situated in the northern part of the Kattegatt Sea.



Figure 1. Map showing rivers with (red) and without (green) confirmed occurrence of *Gyrodactylus salaris* in 2017.

Table 1. Salmon rivers on the Swedish west coast with data on occurrence of *G. salaris*, first year of detection, first and latest year of monitoring and number of fish screened. Rivers sorted from north to south.

No.	River	First G.salaris	Detected	Monitoring First year	Monitoring Last year	No. of fish sampled	Mouth of river Latitude	Longitude
23	Enningdalsälven	0		2001	2014	322	58,9814973939	11,4743260787
22	Strömsån	0		2001	2014	121	58,9392907742	11,1700298178
21	Örekilsälven	0		2001	2017	468	58,4375081576	11,6823772776
20	Bäveån	0		2001	2001	0	58,3452038265	11,9117945868
19	Bratteforsån	0		2001	2015	173	58,2169869981	11,9069601315
18	Arödsån	0		2002	2014	131	58,2288478551	11,9157092664
17	Anråsån	0		2001	2016	164	58,0198664182	11,8798503633
16	Göta älv (Säveår	1	1989	2001	2016	422	57,6900283283	11,897686286
15	Kungsbackaån	1	2017	2001	2017	500	57,462580398	12,0706254533
14	Röfsån	1	2016	2001	2017	648	57,4559234704	12,0764741817
13	Löftaån	1	2003	2001	2005	178	57,309556576	12,1665552662
12	Viskan	1	1998	2001	2001	2	57,2249183234	12,2108584703
11	Himleån	1	2005	2001	2017	697	57,1337716757	12,2511116217
10	Törlan	1	2003	2002	2003	25	57,0012456201	12,3515489321
9	Tvååkersån	1	2002	2002	2002	18	57,023672929	12,3306821942
8	Ätran	1	1991	2001	2016	1071	56,8904496935	12,4842711164
7	Suseån	1	1997	2001	2001	15	56,8406084073	12,5778832294
6	Nissan (Sennan)	1	1998	2001	2001	1	56,6594582252	12,8529790066
5	Fylleån	1	1994	2001	2004	42	56,6202940295	12,9068887271
4	Genevadsån	1	1997	2001	2001	1	56,589846255	12,9344628256
3	Lagan	1	1997	2001	2001	4	56,5192976905	12,9688991809
2	Stensån	1	1997	2001	2015	289	56,4363935055	12,8772847433
1	Rönne å	1	1997	2001	2001	0	56,2716523515	12,8378962394
Total		16				5292		

Atlantic (and Baltic) salmon occurs in several rivers close (within 100 km) to the Norwegian border (Figure 2). On the west coast the River Enningsdalselva constitutes the border river between the countries.

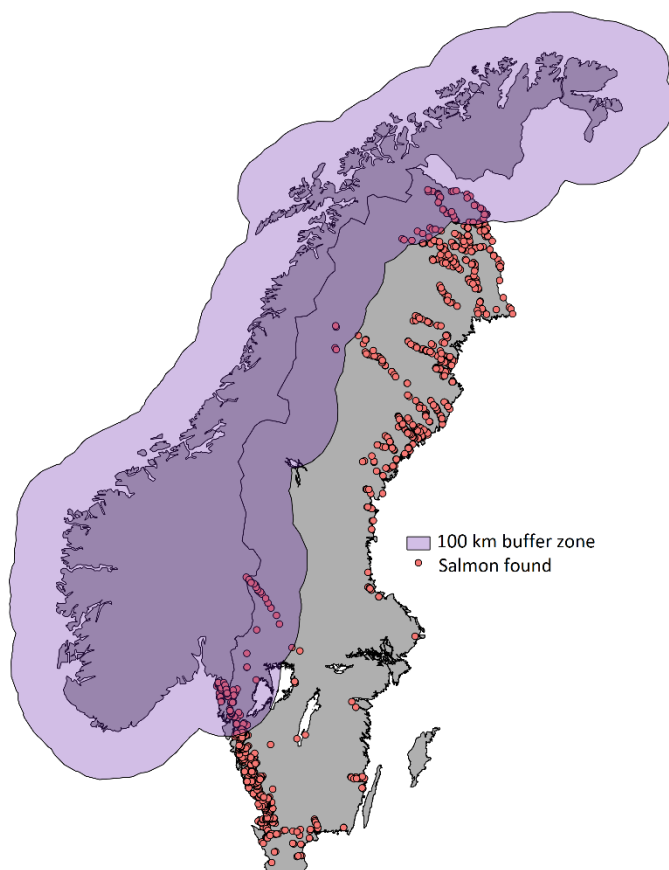


Figure 2. Distribution of salmon in Sweden according to electrofishing results on a map with a 100 km buffer zone (purple) around Norway.

In the northern part of Sweden, the closest sites with Baltic salmon is within 28-72 km from Norway (Table 2).

Table 2. Distance to Norway from the closest sites with presence of Baltic salmon in northern Sweden.

Main River	River	Altitud	Site	Distance to Norway (km)
Torniojokki	Muonio älv	328	Mannakoski	27
Torniojokki	Lainio älv	488		48
Torniojokki	Torne älv	311	Saarikonsuanto	78
Kalix	Kaitum älv	517	Riekko	82
Kalix	Kalix älv	420	Kalixfors	72

On the west coast the closest known occurrence of *G. salaris* is in Göta älv (Grönån) 107 km from the Norwegian border, and in Lake Vänern circa 200 km from Norway. Salmon from

Lake Vänern has since 1932 been transported to the upper reaches of River Klarälven in Sweden to spawn. The large power plant at Höljes impedes further movements upstream into Norway. From Höljes it is 17 km to Norway. *G. salaris* has not been found in the river, but the occurrence has only been investigated once (Olstad et al. (2013). In northern Sweden the distance between known occurrence of *G. salaris* and the Norwegian border is 52 km in River Torniojokki (Lainioälven).

Cooperation with Norwegian scientists has been carried out in risk analyses of a spread of *G. salaris* from Sweden to Norway (e.g. Olstad et al. 2013, Høgåsen et al. 2016). Olstad et al. (2013) studied the risk of spread of *G. salaris* from Lake Vänern (River Göta älv) to Norway via landlocked salmon in River Klarälven/Trysilelva. This was a part of the EU-funded project on enabling free migration of salmon from Lake Vänern into Norway (“Laxens fria gång”). *G. salaris* (haplotype E; as has been identified in the lower parts of River Göta älv) was found on free ranging wild salmon in the lake, but not in the river. It was suggested that *G. salaris* may have been present in the lake for a long time, but it may also be recently introduced. It was concluded that allowing salmon to migrate pass the eleven man-made obstacles (power plants) into Norway would be a large risk of spread of the parasite, but not to Norwegian salmon populations but more probably to Arctic char. Several questions remains, as the pathogenicity of the haplotype, the risk of infection of char etc.

Høgåsen et al. (2016) evaluated the risk of spread of *G. salaris* from rivers in northern Sweden (and Finland and Russia) to Norway. They concluded that illegal stocking of fish was the most important threat, whereas migration of wild fish, fishing gear or use of live bait was less probable risk factors. They suggested that information to the public was an important countermeasure.

Ongoing research

- 1) The monitoring programme initiated in 2001 will continue.
- 2) Additionally, during 2018-2019 fish from all monitored rivers will be re-sampled in order to determine present haplotypes. The analysis will be carried out by the Norwegian National Veterinary Institute.
- 3) A reevaluation of effects of *Gyrodactylus salaris* presence, prevalence and number of parasites per fish on salmon populations will be carried out in autumn 2018 using the Gyro-monitoring database and the Swedish Electrofishing RegiSter (SERS) at the Swedish University of Agricultural Sciences.

Measures to prevent the spread of *G. salaris*

No change has been implemented in national measures in 2018 as compared to the report to NASCO in 2017. Protective measures have been undertaken to avoid spreading the parasite, e.g. ban on stocking or rearing salmonid fish in the whole catchment of not infected rivers with salmonid fish on the west coast.

Presence of *G. salaris* must be reported to the regional county board and the Swedish Board of Agriculture, both wild fish and reared fish. The latter report to OIE (World organisation on Animal health; <http://www.oie.int/>).

Further, there is no culture of salmonid fish in cages in the Swedish part of the Skagerrak area, but an increase of fish farms in the Kattegatt Sea in Danish waters.

Also stocking of reared salmon smolts is only carried out in three already infected rivers (Rivers Lagan, Nissan and Göta älv). Stocking of smolts may result in increased straying and may be considered a potential vector for the spread of *G. salaris*.

Eradication of *G. salaris* in recently infected west coast rivers has not been an issue yet, as infected stocks in the Kattegatt Sea area have not decreased (see GSWG(17)15, Degerman et al. 2012). If the parasite will spread to the Skagerrak Sea area, appropriate measures will be discussed with Norwegian expertise.

A contingency and action plan for all aquatic alien species, including *G. salaris* on the west coast (geographical delineation not clear), will be carried out by the Swedish Marine and Water Agency in 2018.

A leaflet on *G. salaris* was produced and distributed in cooperation with the Sportfishing association of Sweden (Sportfiskarna). An update of the brochure is planned in 2019 (International year of the salmon). Sportfiskarna also reports the latest results on the parasite to the public on their website (<https://www.sportfiskarna.se/Om-oss/Aktuellt/ArticleID/5923>). Articles on *G. salaris* is regularly published in the leading sportfishing journals in Sweden (e.g. <http://www.fiskejournalen.se/sprid-inte-gyrodactylus/>)

Also information on the parasite can be found at the websites of SWAM (<https://www.havochvatten.se/hav/fiske--fritid/arter/arter-och-naturtyper/laxdjavul.html>) and the National Veterinary Institute (SVA) (<http://www.sva.se/djurhalsa/fisk/sjukdomar-hos-fisk/gyrodactylus-salaris-fisk>).

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GSWG(18)07

On-going and planned research concerning *G. salaris* in Denmark (Agenda item 4)

There is neither ongoing nor planned research concerning *G. salaris* in Denmark.

Status on *G. salaris* in Denmark

Atlantic salmon in Denmark are susceptible to the *G. salaris* strain from the River Laerdalselva in Norway (Dalgaard et al. 2004; Heinecke & Buchmann 2007). The parasite has been found several times in rainbow trout farms in Denmark (Buchmann & Bresciani 1997; Buchmann, Lindenstrøm, Nielsen & Bresciani 2000; Nielsen & Buchmann 2001). A laboratory population of *G. salaris* based on parasites isolated from a Danish fish farm showed that this Danish *G. salaris* variant reproduced to only a limited extent on salmon originating from River Skjern Å (Jørgensen et al. 2007). This corresponded to the pathogenicity of another Danish variant of *G. salaris*, which reproduced poorly on Scottish salmon (Lindenstrøm et al. 2003).

In 2005 and 2006 301 parr of wild salmon, *Salmo salar* L., from three river systems in Jutland (River Ribe Å, River Varde Å and River Skjern Å) were examined in December 2005 and August 2006 for *G. salaris* infections (Jørgensen et al. 2008). Only a single specimen of *G. salaris* was found in this study. Compared to a Norwegian form of *G. salaris* (Cunningham 1997; NCBI accession no. Z72477), this parasite had a mutation in the ITS region, G1100–A1100, in three out of seven clones prepared from the PCR product of the ITS-region. A Danish variant of *G. salaris* from a rainbow trout farm has been described, showing the same mutation in three out of four clones (Jørgensen et al. 2007). Challenge studies indicated that this particular variant is non-pathogenic to Danish wild salmon. Besides this mutation, the single specimen recovered from wild salmon had some additional mutations at different sites, which indicates that this is a different Danish variant of *G. salaris* (Jørgensen et al. 2007). Previously, Lindenstrøm et al. (2003) described a third variant of *G. salaris* in Denmark, which also appeared to be non-pathogenic to Atlantic salmon.

The conclusion is that *G. salaris* has been observed in both wild salmon and farmed rainbow trout in Denmark. However, none of the observed forms of the parasite appears to be violent to Atlantic salmon in Denmark.

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Nielsen C.V. & Buchmann K. (2001) Occurrence of *Gyrodactylus parasites* in Danish fish farms. Bulletin of the European Association of Fish Pathologists 21, 19–25.

Exchange of information on monitoring and control programmes for *G. salaris*, and updates on its distribution (Agenda Item 5)

Presently there are no plans of monitoring and control programmes for *G. salaris* in Denmark.

Update on enhanced co-operation on measures to prevent the further spread of the parasite and to eradicate it where it has been introduced including (Agenda Item 6):

- (i) international initiatives; and**
- (ii) national and regional initiatives**

In Denmark it is not allowed to transport wild salmon between watersheds, which (hopefully) prevent introduction of virulent forms of the parasite into Danish salmon rivers.

Anders Koed
April 2018

GSWG(18)08

Gyrodactylus salaris* update paper – contribution from Marine Scotland*Summary**

As part of the GB health zone, Scotland remains certified free from the presence of the parasite *Gyrodactylus salaris* (Gs). No evidence of Gs was detected through samples taken in Scotland during 2017. Risk based, passive and intelligence led surveillance initiatives remain in place together with diagnostic capacity as measures to detect the parasite should it be introduced. Marine Scotland Science is not currently involved in any active research concerning Gs and there are no plans to undertake such research in the near future. Measures remain in place to prevent the risk of introducing the parasite into Scotland, including trade restrictions and the ‘Home & Dry’ campaign. Contingency plans and procedures have been developed to deal with the presence of the parasite within Scotland should this be detected.

Update for 2017**1. Monitoring and distribution of gyrodactylids**

- 1.1 Annex 1 provides sampling data for 2017 on the activity undertaken in Scotland by the Competent Authority¹ in relation to sampling and sample analysis to determine the presence or absence of gyrodactylid species. The structure of this data set reflects historical reports and previous contributions made from Scotland.
- 1.2 The surveillance undertaken continues to support Scotland’s disease free status with respect to *Gyrodactylus salaris* (Gs), as part of the GB health zone². No evidence of the parasite has been detected over the sampling period from 01 January 2017 to 31 December 2017.

Surveillance

- 1.3 Since reporting in 2017 there have been no changes associated with the surveillance methodologies employed. In accordance with Council Directive 2006/88/EC, a risk based surveillance programme is undertaken across aquaculture sites within Scotland.
- 1.4 Passive surveillance and intelligence led initiatives are additional components of Scotland’s aquatic animal health surveillance activity.

¹ Marine Scotland performs the role of Competent Authority for Scotland on behalf of the Scottish Ministers

² The ‘GB health zone’ comprises of the territory of Great Britain which includes the countries of England, Wales and Scotland

- 1.5 There is no targeted surveillance (the screening of healthy fish populations) for Gs but analysis of samples is undertaken through diagnostic investigations conducted either as a

result of risk-based surveillance in the case of farmed fish, or through intelligence initiatives, as an output from passive surveillance, in the case of farmed fish and fisheries³.

- 1.6 Further description and details of the surveillance being employed is contained within GSWG(17)15 Annex 7.

Population surveys

- 1.7 Population survey work continued throughout 2017 as part of an on-going programme as reported within GSWG(17)15 Annex 7. It is recognised that, whilst this activity is not actively searching for the presence of Gs, it does give an assessment, to a certain extent, of the ecological health of wild salmonid populations in any given area. Where repeated and structured surveys are undertaken this could provide a reliable indicator of a problem, e.g. a lack of juvenile salmon populations in an area where they were previously plentiful.
- 1.8 New structures are being developed for coordinated local sampling of fish to support the salmon conservation regulations⁴. This programme may provide more generally structured and robust warning system with respect to the presence of Gs.

Diagnostic capability and activity

- 1.9 Marine Scotland Science (MSS) is the Scottish National Reference Laboratory for fish, molluscs and crustacean diseases within the European Union
- 1.10 The primary diagnostic methods employed in relation to Gs, rely solely upon molecular techniques and include a Q-PCR multiplex assay, followed by sequencing. This represents the standard diagnostic practice in relation to the diagnosis of gyrodactylids by MSS.
- 1.11 Morphological capabilities have been maintained and could be reintroduced in the future if required.
- 1.12 With regards to the detection of Gs, the diagnostic methods employed by MSS satisfies the recommended methodology detailed within the OiE Manual of Diagnostic Tests for Aquatic Animals (2017).

³ 'Fisheries' in this context refers to both wild fish populations and put-and-take / sport fisheries and these are differentiated where required throughout the report

⁴ <http://www.gov.scot/Topics/marine/Salmon-Trout-Coarse/fishreform/licence>

2. On-going and planned research concerning *G. salaris*

- 2.1 At present MSS is not actively involved in any scientific research work concerning Gs. Despite this, the organisation maintains knowledge of developments in this area through national and international discussions and contact with other research parties through attendance at conferences and meetings involving the community and national reference laboratories.

3. Measures taken to prevent spread and to eradicate

International initiatives

Trade restrictions

- 3.1 Trade restrictions, as detailed within GSWG(17)15 Annex 7, remain in place. These are detailed below in paragraph 3.2.
- 3.2 Scotland (as part of the GB health zone), has recognised disease freedom with respect to Gs. As a result, trade restrictions, granted through EU Commission Decision 2010/221, are in place and assist in preventing the import of Gs through commercial activity involving the trade in live aquatic animals. With respect to Gs, imports are permitted only where they are accompanied by a health certificate confirming that the animals:
- a) originate from an area free from Gs, or
 - b) they have been held immediately prior to dispatch in saltwater for a designated period⁵, or
 - c) in the case eggs they have been disinfected prior to dispatch
- 3.3 These measures assist in protecting Scotland from the introduction of the parasite through commercial activity associated with live aquatic animal trade.
- 3.4 Scotland also supports the United Kingdom as an EU member state, by providing comments on the OiE Aquatic Code and Aquatic Manual. These documents cover international recommended standards and practices with respect to specific pathogens, including Gs. Areas covered include:
- trade in and movements of aquatic animals and aquatic animal products
 - health status including disease freedom
 - biological and aetiological characteristics of pathogens
 - surveillance, sampling and diagnostic techniques and procedures

⁵ The certificate requires a minimum of 25ppt saltwater for at least 14 days

National and regional initiatives

'Home & Dry' campaign

3.4 Throughout 2017 Scottish Government continued its 'Home & Dry' campaign. This involved the dissemination of leaflets and information including a two page publication within Fish in Scotland 2017 – a popular annual publication produced by Visit Scotland. More recently (early 2018) online resources have been updated and through collaboration with Scottish Natural Heritage Gs has been the focus of an Invasive and Non Native Species poster campaign at Inverness Airport.

Actions taken by wild fishery stakeholders

3.5 As detailed within the 2017 report (GSWG(17)15 Annex 7) wild fishery stakeholders continue to undertake measures aimed at preventing the introduction of the parasite within Scotland. These include:

- ensuring disinfection of fishing equipment by action or certificate prior to use
- providing equipment to visiting anglers, to avoid potentially infected equipment being used
- educating anglers in best practice in relation to the risks of aquatic animal disease
- developing catchment and river contingency plans in the event of an outbreak of Gs
- mapping and surveying of catchments to facilitate with eradication if required

Contingency Planning

3.6 Scottish Government has developed and maintains generic contingency plans to deal with outbreaks of listed disease in accordance with Council Directive 2006/88/EC. In the event of an outbreak, operational and strategic responses will be undertaken by Marine Scotland with a view to containing and eradicating disease where possible.

3.7 In recognition of the additional challenges posed by Gs, in terms of the potential impacts on wild fish, discrete contingency plans have been developed to deal with an outbreak of the parasite in Scotland. Part of the contingency procedure recognises the extensive expertise and experiences within Norway in terms of containing and eradicating. Agreements have been established to utilise this expertise should the need arise.

3.8 Scottish contingency plans for Gs are currently in their 4th edition and were last revised in March 2011. The need for further update and revision is recognised. Contingency procedures were subjected to further testing in relation to Viral Haemorrhagic Septicaemia virus through Exercise Galatea in January 2018. The Contingency Plans maintained for all aquatic animal disease, including Gs, will be revised in the light of lessons learned from Exercise Galatea.

Annex 1 - Gyrodactylid sampling in Scotland 2017 conducted by MSS

Overview

No *G. salaris* were identified.

Total No. of cases: 12

No. of farm cases: 4 (3 cases at same site)

No. of wild cases: 7

Total No. of fisheries⁶ sampled: 1

Total No. of fish examined: 40

Total No. of farmed fish examined: 25

Total No. of wild fish examined: 14

Total No. of fishery fish examined: 1

No. of +ve farm cases: 0

No. of +ve wild cases: 0

No. of +ve fisheries: 0

Breakdown of sampling for gyrodactylids

Farmed fish sampling

Fish species	Cases	No. sampled per case	Region	Result	Parasite species
Atlantic salmon	3	5	Strathclyde	-ve	
		10	Strathclyde	-ve	
		5	Strathclyde	-ve	
Rainbow trout	1	5	Strathclyde	-ve	

Fishery sampling

Fish species	Cases	No. sampled per case	Region	Result	Parasite species
Rainbow trout	1	1	Tayside	-ve	

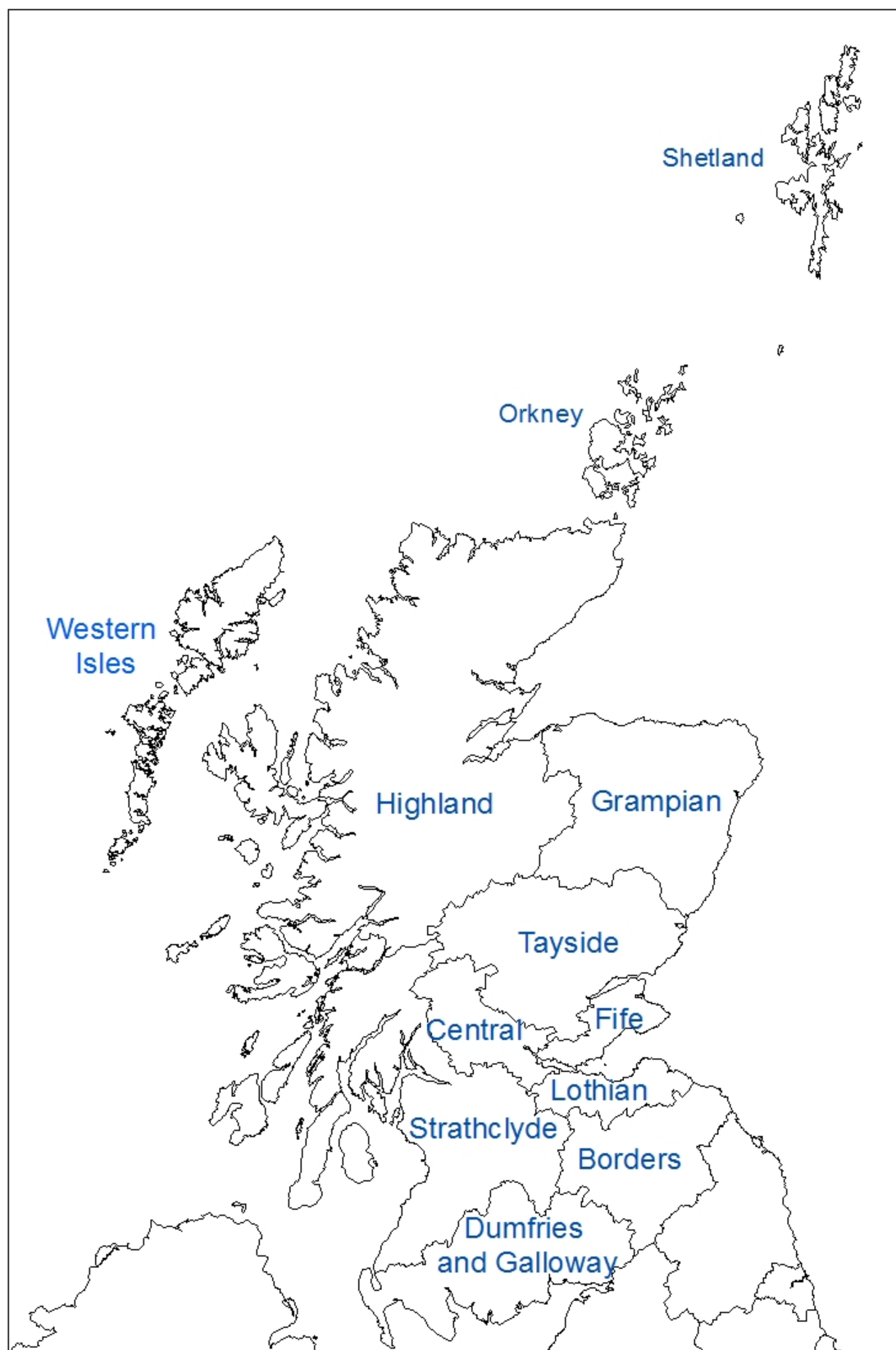
⁶ Fishery / fisheries within this section refers to put-and-take / sport fisheries and excludes wild fisheries

Wild fish sampling

Fish species	Cases	No. sampled per case	Region	Result	Parasite species
Atlantic salmon	5	5	Dumfries & Galloway	-ve	
		1	Grampian	-ve	
		1	Grampian	-ve	
		2	Grampian	-ve	
		1	Grampian	-ve	
Pink salmon	1	2	Grampian	-ve	
Brown trout	1	1	Grampian	-ve	
Sea trout	1	1	Grampian	-ve	

NB total number of cases in tables adds up to 13 as one case included salmon and sea trout

Annex 2 - Map identifying the regions of Scotland



GSWG(18)09

Gyrodactylus salaris monitoring in Northern Ireland*(Update April 2018)*

Section 4 - GS monitoring is carried out as part of DAERA Fish Health's disease testing regime. A rolling regime of testing takes place across both operational fin fish farms and wild catchment areas (by electrofishing) This equates to between 10 – 12 sites each for both farmed and wild stock areas being monitored each year. The testing work is carried out by AFBI on our behalf as a part of their Annual Work Program and the SLA with the Fish Health section. There is no planned research into GS.

Section 5 - see below. Table 1 and 2 shows the results for fin fish farms and rivers tested in 2017 respectively. The map on page 3 shows all rivers and farms tested in 2017 and the map on page 4 shows rivers and farms tested from 2004 – 2017. Gyro species were detected in a number of instances but the presence of *G. salaris* was ruled out by real time PCR analysis.

Section 6 on the agenda– no comments.

DAERA has been part of new UK initiative to prevent the spread of invasive species by raising awareness and a targeted campaign has been launched advising anglers of the steps needed to be taken to prevent their spread.

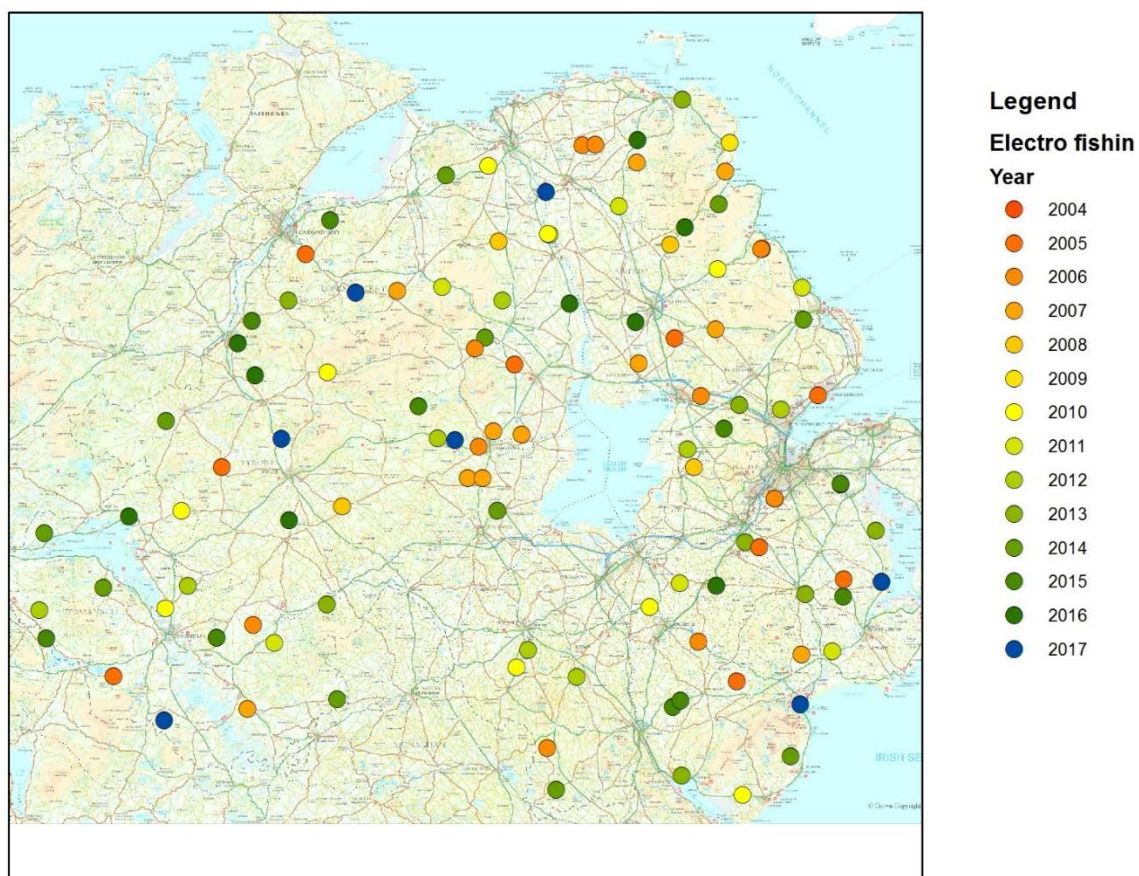
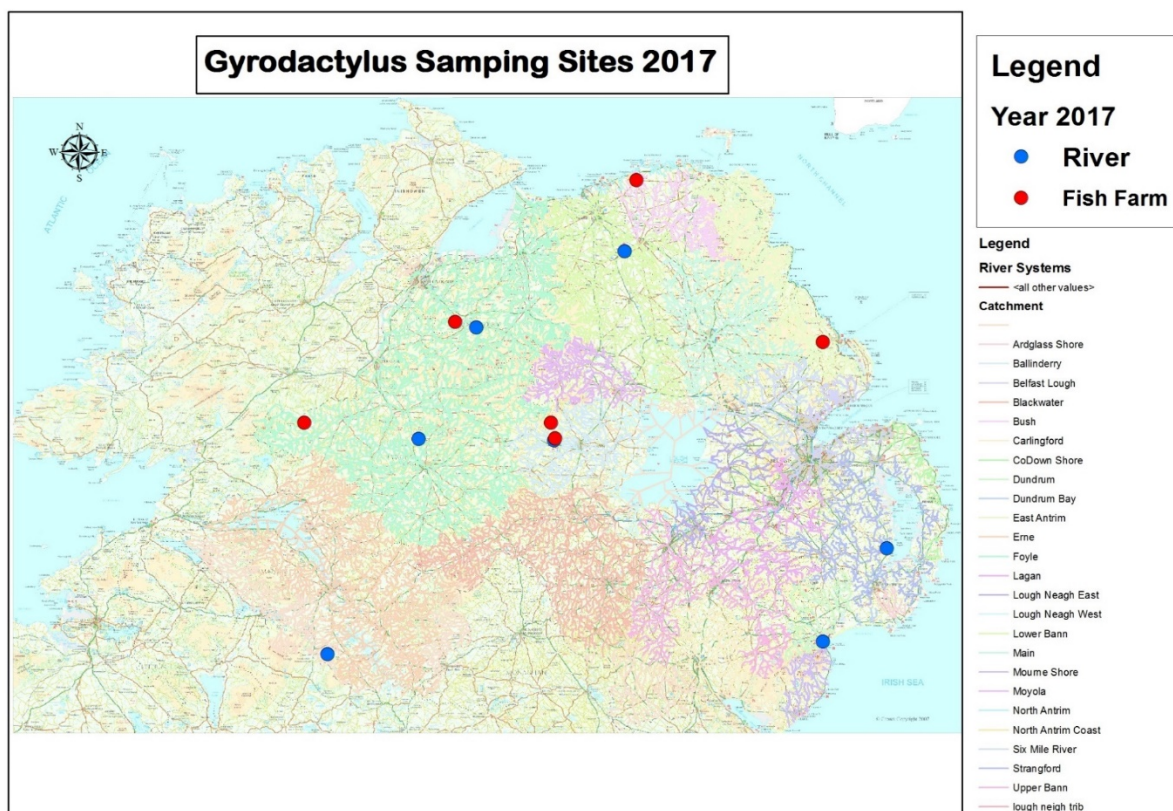
Work is ongoing to update the NI and Cross border contingency plans for GS.

Table 1

2017 – Farmed Fish Testing				
Farm	Species	No. Sampled	Result	Species
Bush Salmon Station	Atlantic salmon	30	-ve	
Ballyartan	Rainbow Trout	30	+ve	G. species (not salaris)
Sperrin Mountain	Rainbow Trout	30	-ve	
Derrinleagh	Rainbow Trout	30	-ve	
Seven Springs	Rainbow Trout	150	-ve	
Corgary	Rainbow Trout	150	-ve	
Seven Springs	Rainbow Trout	150	-ve	
Total	-	570	1 positive	G. species (not salaris)

Table 2

2017 – Wild Fish Testing (Rivers)				
River	Species	No. Sampled	Result	Species
Swanlibar	Mix of Atlantic salmon and Brown Trout	30	+ve	G. species (not salaris)
Cappagh Burn	Mix of Atlantic salmon and Brown Trout	30	+ve	G. species (not salaris)
Ballinderry	Mix of Atlantic salmon and Brown Trout	30	-ve	
Shimna	Mix of Atlantic salmon and Brown Trout	17	-ve	
Faughan	Mix of Atlantic salmon and Brown Trout	30	-ve	
Dibney	Mix of Atlantic salmon and Brown Trout	30	-ve	
Ballymoney	Mix of Atlantic salmon and Brown Trout	25	-ve	
Total	-	192	2 positives	G. species (not salaris)



GSWG(18)11

Irish Briefing Paper on Gyrodactylus salaris (Tabled by EU Ireland)**Scope**

This document provides a briefing paper for the 2018 meeting of the Working Group on *Gyrodactylus salaris* in the North-East Atlantic Commission Area. The paper provides country-specific details of the following: *monitoring and control programmes and distribution of the parasite; ongoing and planned research; and measures being taken to prevent the spread of the parasite and eradicate it where it has been introduced.*

1 Background

Gyrodactylus salaris is listed as a notifiable disease in Ireland and legislation is in place preventing the transfer of live fish capable of carrying the parasite to or within Irish waters. The parasite is not listed in Council Directive 2006/88/EC, which has been applied since 1 August 2008, and replaces the previous fish health regime under Directive 91/67/EEC. However, Ireland retained additional guarantees under Decision 2004/453/EC in respect of *G. salaris* and can continue to control imports and suspected or confirmed outbreaks under the European Communities (Health of Aquaculture Animals and Products Regulations) 2008. These additional guarantees have been recognised as “national measures” under Article 43 of Council Directive 2006/88/EC. This has been reflected in Commission Decision 2010/221/EU, which replaces Commission Decision 2004/453/EC.

2 Distribution of *Gyrodactylus salaris* in Ireland

Gyrodactylus salaris has not been recorded on the island of Ireland to date.

3 Monitoring and control programmes *Gyrodactylus salaris* in Ireland

Since 2005, wild salmon parr from selected river systems are examined annually for the presence of *G. salaris* in Ireland (Appendix 1, Table 1). This monitoring is undertaken in conjunction with the catchment-wide electrofishing programme managed by Inland Fisheries Ireland (IFI) with sample analyses undertaken by Fish Health Unit (FHU) of the Marine Institute (MI). Further to this, the MI are responsible for investigating unexplained abnormal or significant fish mortalities encountered in Ireland which may be a result of fish disease.

4 Ongoing and planned research

There is no ongoing or presently planned research on *G. salaris* in Ireland, with the exception of the ongoing annual monitoring programme.

5 Measures being taken to prevent the spread of the parasite and eradicate it where it has been introduced.

A detailed contingency plan for dealing with any outbreak of *G. salaris* in Ireland has been completed in 2017 by the FHU with input from IFI and other stakeholders with statutory interests in salmonids (Anon. 2017). The plan has been forwarded to NASCO in advance of the 2018 *G. salaris* meeting.

The plan sets out in detail the operational responsibilities and actions to be taken in the event of a suspected outbreak of gyrodactylosis. This includes the following:

- The convening of the National Disease Strategy Group (NDSG) to activate and oversee the implementation of the contingency plan. The group will comprise senior representatives from relevant Government Departments and State Bodies as well as expert national and international veterinary scientists;
- The establishment of National Control Centre (NCC) overseen by the NDSG for the purposes of co-ordinating control / eradication measures. The NCC will include representatives of the FHU, Inland Fisheries Ireland, Departmental veterinary inspectors, the cross-border Loughs Agency and relevant representation from Northern Ireland.
- A communications strategy.
- Detailed actions to be implemented on the suspicion or confirmation of a gyrodactylosis outbreak.
- Sampling, testing and fish disposal protocols.
- Containment, eradication and treatment options.

Appendix 1

Table 1 Irish river systems sampled for the presence of *G. salaris* (2005 – 2017).

Catchment	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Abbert, Corrib						X		X					
Aherlow	X												
Araglin								X					
Aughnacliffe				X									
Aughrim/Avoca										X			
Bilboa					X								
Boyne trib.									X				
Bride						X							
Brosna			X						X				
Bunnoe			X										
Burrin			X										
Carrigahorig		X								X			
Munster Blackwater										X	X	X	X
Derry	X												
Dunkellin						X							
Eanymore						X							
Emlagh							X						
Erne										X			
Erne, Swanlinbar			X										
Erriff						X	X						X
Feale					X				X				
Finnow								X				X	
Garavogue						X							
Glen							x						
Greese					X								
Laune										X			X
Leannon							X				X		
Lee		X											
Little Brosna			X										
Maine											X		X
Moy								X					
Owenboliska						X							
Owenmore													
Owenwee							X						
Poulmounty			X							X			
Screebe		X	X					X					
Suir											X		
Tullaghobegley									X				
Waterville (Currane)													X

6 References

Anon. (2017). Operations Manual for dealing with Outbreaks of *Gyrodactylus salaris* in Ireland. Fish Disease Operations Manual for Ireland. Marine Institute, Ireland, 47 pp.