The Scottish Government

Gyrodactylus salaris

Contingency Plan

Fourth Edition
March 2011

CONTENTS

Contingency Plan for dealing with Suspicion and/or Confirmation of *Gyrodactylus salaris* in Scottish Waters

Assumptions

This plan:-

- Follows the outline structure of the Scottish Government (SG) Contingency Plan for Foot and Mouth Disease to make use of information and expertise already within Scottish Government
- Uses information already available from previous SG Contingency Plans.
- Outlines the broad principles in the text and places detailed instructions and information in groups of appendices
- Assumes that Ministers will wish to choose between containment and eradication depending on the severity and distribution of the disease, the feasibility of the two options and the economic health of the fish farming/recreational fisheries industry at the time of any disease outbreak. The choice will also consider the need to preserve salmon stocks.
- Assumes there may be some rivers where eradication is not possible. The choice between containment and eradication will have to be made on a catchment by catchment basis. The overriding criterion will be that there are no preconceived ideas.
- Assumes that resources will be available from across the SG if Ministers decide to take action.
- Assumes that use of private contractors will be sanctioned.
- Assumes that any necessary legislation will either be in place or can be implemented rapidly by amending orders.
- Assumes that DEFRA and Environment Agency will co-operate on cross border issues.
- Assumes that basic data in the appendices/ Operations Manual will be checked on regular basis and updated as required.

CONTINGENCY PLAN

1. Foreword

Context

1.1 Gyrodactylosis is a Notifiable disease caused by the parasite *Gyrodactylus salaris,* which if introduced into Scottish salmon rivers has the potential to cause widespread losses in the valuable stocks of wild Atlantic salmon.

1.2 *G. salaris* is a monogenean helminth parasite (skin and gill fluke) which has caused the virtual elimination of Atlantic salmon stocks from a number of rivers in Scandinavia and Northern Russia. The status of other Western European stocks of salmon is unclear.

1.3 *G. salaris* causes disease in Atlantic salmon, uses rainbow trout and Arctic charr as carrier hosts on which it can reproduce and uses brown trout as a transport host. Arctic charr, in Norway, have been shown to maintain a population of *G.salaris* in the absence of salmon although the strain has a low pathogenicity for Norwegian Atlantic salmon. *G. salaris* may reproduce on brown trout but not at a rate sufficient to maintain a viable population in the absence of Atlantic salmon.

1.4 The parasite is exotic to Scotland and it is highly improbable that the infection could enter the country by natural means because of the inability of the parasite to survive in full strength seawater. Significant risk is therefore associated with the actions of man both in the trade in fish and fish eggs and via leisure pursuits.

1.5 Commission Decision 2010/221/EU recognises that Great Britain has demonstrated freedom from *G. salaris* and Scotland maintains a surveillance programme to determine continued absence of the disease. The Decision therefore provides certain protective measures for GB with regard to *G. salaris* in salmonids. (See Appendix 1)

1.6 The importation of live salmonids from areas of lower health status, with respect to *G. salaris*, is prohibited into Great Britain although importation of disinfected eggs is permitted from areas affected with *G. salaris*. NB Imports of live salmonids can occur from areas of a country that has *G. salaris* providing that the area from which stock are imported meets the requirements of Commission Decision 2010/221/EU

1.7 The national and local government bodies involved in this contingency plan include the Scottish Government (SG) (through Marine Scotland Science (MSS) including the Fish Health Inspectorate (FHI)), Scottish Environment Protection Agency (SEPA), Association of Salmon Fishery Boards (ASFB), Scottish Natural Heritage (SNH), Scottish Water and Local Government Authorities in affected areas. Equivalent bodies in England (Defra, Cefas, Environmental Agency and English Nature) will be involved where catchments cross the Scotland/England border. Successful control action will rely on assistance from all riparian owners, occupiers, angling organisations, fish farmers and all those commercial and leisure activities that rely on water resources for all or part of their activities.

1.8 The roles and responsibilities of key personnel and organisations can be found in the following sections of the plan:-

- Role of Disease Strategy Group (DSG)—Command & Control Section

- Role of National Disease Control Centre (NDCC)—Command & Control Section
- Membership of DSG—Appendix 6
- Membership of NDCC—Appendix 11 section 3
- Roles and job descriptions of Head of DSG, Head of NDCC, Communications Co-ordinator, Head of LDCC and Team Leaders in Marine Directorate—Appendix 6 (page 88)
- MSS—flow charts at end of Appendix 11(pages 171 on) showing actions required in relation to suspicion and confirmation of disease, placing of movement restrictions, sampling instructions, epizootic investigations and eradication procedures.
- Stakeholders (Scottish Government groups, external enforcement and advisory bodies, fishing interests, users of water for leisure and industrial purposes)—Appendix 2 (page 36)

1.9 The successful implementation of this plan will require all of the above individuals/groups to understand and implement their respective roles.

Legislative basis for action

1.10 The control measures contained in this Contingency Plan can be delivered through powers contained in the Aquatic Animal Health (Scotland) Regulations 2009 and the Aquaculture and Fisheries (Scotland) Act 2007. Scottish Ministers have responsibility for implementation of the Aquatic Animal Health (Scotland) Regulations 2009 and have authorised the Fish Health Inspectorate (FHI) to act under these regulations for fish disease control. Additional inspectors can be appointed by Ministers to deal with emergency situations.

1.11 *G. salaris* was designated as a Notifiable disease in 1988, under The Diseases of Fish Acts. These Acts were repealed by the Aquatic Animal Health (Scotland) Regulations 2009 but the powers have been retained. When the competent authority (Scottish Ministers) suspects that *Gyrodactylus salaris* maybe present in waters it shall initially designate the area in the form of a written notice. This Initial Designation Notice (IDN) may require a variety of actions (see Appendix 1 paragraphs 1 & 2) When the competent authority confirms that disease is present it shall designate the infected area by means of a Confirmed Designation Notice (CDN). Details of conditions which maybe imposed can be found at Appendix 1 paragraphs 1 & 2.

1.12 Official controls can be applied to the movements into or out of the area covered by the IDN or CDN of live fish, live fish eggs and fish foodstuffs.

1.13 An IDN or CDN can make provision for the removal and disposal of dead and dying fish from the area.

1.14 An authorised inspector may, by means of the conditions attached to an IDN or CDN, control the movement in or out of a fish farm of live fish, live fish eggs and foodstuff if he/she has reasonable grounds for suspecting that the fish are infected with *G. salaris*. An inspector also has powers under Regulation 26 of the Aquatic Animal Health (Scotland) Regulations 2009 to take other actions.

1.15 In Scotland a relevant person is guilty of an offence if they fail to report the suspicion or presence of *G. salaris.* (see Appendix 1 paragraph 1 for details).

1.16 Inspectors are empowered to enter and inspect land and premises and to take and examine samples of water and aquatic animals.

1.17 *G. salaris* is included as a List III disease in Annex A of Council Directive 91/67/EEC (as amended) but control measures are not specified. However, in response to evidence that *G. salaris* is not present in Scotland and that Scottish salmon stocks are highly susceptible to the disease, certain protective measures were granted to Great Britain by Commission Decision 2004/453/EC. This prevents the movement into the country of live salmonids and non-disinfected salmonid ova from areas not shown to be free from *G. salaris*

1.18 Disposal of all dead fish or other high-risk material is governed by the Animal By-Products (Scotland) Regulations 2003 which implements EU Regulation 1774/2002. Dead farmed fish from an area subject to an IDN or CDN with respect to *G. salaris* will be specified as Category 2 waste and disposal would be via approved routes to an approved disposal site. Such movements would be made under the supervision of the Fish Health Inspectors and of Local Authority Animal Health Inspectors.

1.19 A list of relevant legislation covering fish disease, environment and water issues can be found at Appendix 1.

Part of GB covered

1.20 This Scottish Government Contingency Plan covers the actions to be taken in the event of suspicion or confirmation of *G. salaris* in any part of mainland Scotland or on any Scottish island. It will also be used to determine the Scottish response to any cross border issues e.g. in relation to activities on the Tweed and the Esk. In the event of an outbreak of *G. salaris* in any part of the Tweed, containment and/or eradication will be the responsibility of Scottish Ministers in co-operation with their Defra counterparts. In the event of an outbreak of *G. salaris* in any part of the Esk, containment and/or eradication will be the responsibility of Defra Ministers in co-operation with their Scottish counterparts. In the event of restrictions having to be served in cross border catchments, Scottish Ministers will issue Designation Notices to cover those waters in the Tweed or Border Esk catchments that lie within Scotland and Defra Ministers will issue Designation Notices to cover those waters that lie within England.

Links to Other Plans (UK & Local)

1.21 This plan must be read in conjunction with the Operations Manual at Appendix 11 and any decisions made during the outbreak to contain and/or eradicate the parasite and with any relevant instructions issued by Scottish Ministers since the plans were last updated. Appendix 12 contains a template based on the eradication protocols for a Norwegian river. It will be used to develop catchment specific eradication plans in the event of an outbreak. Defra have responsibility for notification of disease to European Union (EU) Office Internationale des Epizooties (OIE) and will also co-operate on cross border issues. (See 1.20 above).

1.22 Areas Covered in this plan

Area	Detail	Reference
Assumptions and Foreword	Sets out the assumptions, context and legislative basis on which plan is based and the areas to which it relates	Section 1 - Introduction
Disease Response assumptions	Summarises the policy objectives on which plan is based and the biology of *G.salaris.* Deals with actions to detect and diagnose the disease and actions to be taken on suspicion and confirmation of disease	Section 2 Appendix 11 Operations Manual
Command and Control	Explains roles of Disease Strategy Group, National Disease Control Centre, Expert group, Strategic Co-ordination Groups and stakeholders. Covers responsibilities and job descriptions of Lead Players and defines training policies	Section 3 Appendix 6
Field Operations	An initial policy summary is the basis for the detailed operations that occur in the Operations manual	Section 5 Appendix 11
Communications	Sets out Communications Strategy and policy and use of a communication coordinator. Deals with media briefing, help lines, responses to correspondence and provision of web sites	Section 6 Appendix 5
Resources	Addresses accommodation and staffing, Field operations; laboratories; information technology; personnel; equipment; stakeholder support; support from other government departments (Defra, Cefas)	Section 7– Appendix 8
Operations manual	Expands on the general details in the plan Details actions to be taken on suspicion; confirmation; movement restrictions; field investigations; epizootic investigations; diagnosis; eradication; demonstrating freedom.	Appendix 11

Changes to the Contingency Plan

1.23 When changes are made to this plan a summary of the latest substantial changes will appear in this section for ease of reference. Changes which amend errors or provide clarification to existing text are not listed here. The following changes have been made at the revision in **March 2011**.

Page	Paragraph /Appendix	Detail
		Marine Directorate changed throughout to Marine Scotland
		Fisheries Research Service (FRS) changed throughout to Marine Scotland Science (MSS)
6	2.1	Objectives on which control strategies are based clarified
11	3.3	Role of Disease Strategy Group (DSG) strengthened and redefined
12	3.5-3.7	Role of National Disease Control Centre (NDCC) strengthened and redefined
13	3.8	Expert Group will only be formed if disease occurs
17-18	4.1-4.5	Rewritten to reflect the changes brought about by formation of Marine Scotland and restructuring thereafter
20	5.9	Rewritten to reflect changes in legislation with introduction of the Aquatic Animal Health (Scotland) Regulations 2009
27	Appendix 1	Rewritten to take account of a) changes in legislation via Aquatic Animal Health (Scotland) Regulations 2009 b) Implementation of Commission Decision 2010/221/EU c) the inter relationship between various legislation in relation to water environment
34	Appendix 2	Minor changes to description/functions of some stakeholder groups. Web links included for external stakeholder groups where known
38	Appendix 2 para 16.1	Clarification of Local Authority enforcement role in respect of Animal By-Products
59	5	Clarification of actions to be taken on confirmation of disease
60	6	Clarification of Protocols to declare freedom from disease.
73-76	Appendix 5	Changes to notification letters to include reporting of negative cases
89-90	6-7 & Annex 2	Changes to responsibility for policy and operational issues to reflect changes in structure of Marine Scotland
94	Annex 3	New describing DSG actions in the event of suspicion or confirmation.
95	Annex 4	New describing NDCC actions in the event of suspicion or confirmation.
133	4.14	Changes to system for issuing movement consents
123-179	Appendix 11	Operations Manual rewritten
126	1.2	Amendment made relating to the national measures for Gs
126	1.7	Reference to the Disease of Fish Act 1937 replaced with reference to the Aquatic Animal Health (Scotland) Regulations 2009

128	2.11 (2)	Reference to the Aquaculture and Fisheries (Scotland) Act 2007 changed to the Aquatic Animal Health (Scotland) Regulations 2009
129	2.14 (2)	Inclusion of point to send samples to the OIE for corroboration
129	2.14 (5)	Addition of detail to include video/telephone conferencing as a method of communication with stakeholders
132	4.1	Reference to the Disease of Fish Act 1937 replaced with reference to the Aquatic Animal Health (Scotland) Regulations 2009
132	4.3	Reference to TDN and DAO replaced with references to IDN and CDN
133	4.11 (Final bullet)	Where there is widespread disease and little chance of eradication consideration is given to the purpose of continuing control measures
134	4.13	Addition of the general principle regarding permission for movements
134	4.14	Changes to the procedures in granting approval for fish movements subject to restrictions
135	5.5	Change to the storage location of the wild fish file
138	5.26	Changes associated with SOP FHI Field 040 regarding the election of fish for sampling. Fish are no longer selected for routine VHS/IHN screening
139	5.33	FRS Government Procurement group changed to Scottish Government Procurement
142	6.20	Reference to the Aquaculture and Fisheries (Scotland) Act 2007 changed to the Aquatic Animal Health (Scotland) Regulations 2009
143	7.4	Revision of SOP list to reflect the amalgamation and changes to SOPs
144	8.1	Includes reference to SCOFCAH and 2006/88/EC regarding approval of plans for eradication
148	9.1	Inclusion of reference to the risk assessment procedure for withdrawing movement restrictions
149	9.5	Removal of reference to 2001/183/EC
149	9.7	Includes reference to the Epidemiology Group informing DSG on the level of suspicion and reference to the approval of eradication plans through the European Commission.
154	Annex 1	Changes regarding group names and composition of the NDCC
161	Annex 4	Revision to the decision tree for diagnosis
164	Annex 6a	
	Q2	Updated regarding parasite distribution
	Q9	Change to FHI email address
	Q11	Updated regarding infection densities – higher density infection over the fins and body in comparison to the gills

	Previous Q14 Q14 and Q15 Q17	Question removed as repetition of Q2 Reference to 2004/453/EC replaced with reference to 2010/221/EU Inclusion of advice relating to Aluminium sulphate treatments
170	Annex 7	Re-written in relation to SOP revision and amalgamation
173	Flowchart 2	Terminology changed reference to TDN and DAO replaced with reference to IDN and CDN
180	Appendix 12	New—template from which to develop a river treatment programme
214	Appendix 13	Glossary—previously Appendix 12

Contact point to notify changes

1.24 Proposals for amendments to this plan should be put in writing to:-

Scottish Government
Marine Scotland
Area 1B North
Victoria Quay
EDINBURGH
EH6 6QQ

2. Disease Response Assumptions

This section deals with the overview and more detailed information is given in Appendix 4 (See page 59)

Policy Objectives

2.1 In the event of an outbreak or incident, the disease control strategy adopted will be consistent with the United Kingdom's European Union obligations and in line with the appropriate EU legislation and consistent with Scottish legislative requirements. Scottish Government's first objective in tackling an outbreak of *Gyrodactylus salaris* is to restore Scotland's disease free status as quickly as possible. In doing so Scottish Government will seek to select control strategies which:

- Protect public health.
- Minimise the number of animals which need to be culled either to control the disease or on welfare grounds, and which keep animal welfare problems to a minimum.
- Cause the least possible disruption to the food, farming and tourism industries, to visitors to the countryside, and to rural communities in the wider economy.
- Minimise damage to the environment.
- Minimise the burden on taxpayers and the public.

2.2 The policy for dealing with an outbreak of *G. salaris* in either wild or farmed freshwater fish stocks will be based on a strategy of eradication but where this is deemed to be unachievable a strategy of containment will apply.

2.3 When *G. salaris* is first confirmed a national standstill may be implemented until the distribution of disease has been established by monitoring. Thereafter movement restrictions will be imposed over all infected and buffer catchments including fish farms. The decision on what to do with stocks of fish in transport within or from the catchment at the time movement restrictions are imposed will be decided by the Disease Strategy Group on advice from Marine Scotland Science. Unless there are special circumstances it is likely that such fish will be killed on arrival. The movement of fish for processing will be by licence which will specify the containment measures to be taken in transport and processing to prevent the spread of the disease.

2.4 Provision will be made for the declaration of catchments surrounding an infected catchment to be declared as buffer zones, with the imposition of movement restrictions. Buffer zones will be used to separate the infected area from the rest of Scotland to help to reduce the risk of disease spread.

2.5 A major publicity drive will be implemented as part of the communications strategy. It will aim to make as many people as possible aware of the problem and the steps which they need to take to prevent further spread of the parasite.

Biology of *G. salaris*

2.6 *G. salaris* is a monogenean helminth parasite (skin and gill fluke) which has caused the virtual elimination of Atlantic salmon stocks from a number of rivers in Norway, Western Sweden, northern Finland and Northern Russia. The status of other Western European stocks of salmon is unclear. *G.salaris* has also been identified on farmed salmon in Latvia and on rainbow trout in Germany, Macedonia, Poland and Italy.

2.7 *G. salaris* is unable to survive freezing, elevated temperatures, full strength seawater or desiccation. The parasite can survive 5-7 days off the host under damp cool conditions. It is highly fecund, can rapidly detach from dead hosts but is very good at finding a new host.

2.8 *G. salaris* causes disease in Atlantic salmon, uses rainbow trout and Arctic charr as carrier hosts on which it can reproduce and uses brown trout as a transport host. Arctic charr, in Norway, have been shown to maintain a population of *G.salaris* in the absence of salmon in at least one Norwegian river although the strain has a low pathogenicity for Norwegian Atlantic salmon. *G. salaris* may reproduce on brown trout but not at a rate sufficient to maintain a viable population in the absence of Atlantic salmon. Knowledge of the interactions between potential hosts and transport hosts and *G. salaris* is incomplete. Details of current knowledge is contained in Annex 1 of Appendix 3

2.9 The parasite is exotic to Scotland and it is highly improbable that the infection could enter the country by natural means because of the inability of the parasite to survive in full strength seawater. Significant risk is therefore associated with the actions of man particularly in the trade in live fish and fish eggs and, to a lesser extent, via leisure pursuits.

2.10 The introduction of *G. salaris* into Scotland is likely to cause serious disease in affected stocks of wild Atlantic salmon, leading to the eradication of a large proportion of salmon stocks in affected catchments. It is thought unlikely that there are any river and/or loch systems in Scotland where salmon are present but brown trout are not. There is thus a potential for brown trout to carry *G. salaris* between salmon populations.

2.11 The potential serious consequences of an outbreak of *G. salaris* in Scottish Atlantic salmon stocks make it imperative that most effort and resources must be directed at preventing the primary introduction of the parasite. Containment will also be a primary weapon even if eradication is not practical in a given situation. Containment, to prevent further spread, is also necessary while a decision is taken on the feasibility of an eradication programme and to allow time to plan and implement any programme.

2.12 Activities where there is an identifiable risk of introducing the infection into Scotland are described in the Risk Assessment (Appendix 4) The management of these risks will form part of the strategy to prevent the introduction of the parasite into Scottish waters.

Risk Assessment

2.13 This Contingency Plan is based on the principles of risk assessment and risk management. Consequently, the risk assessment first conducted on *G. salaris* in 1995 was updated in August 2000. A group was set up in 2005 to consider how best to prevent the introduction of *G. salaris* into Scotland. An updated risk assessment incorporating that group's recommendations is at Appendix 4 Annex 1 (See page 63).

2.14 This Contingency Plan provides clear instructions for an official response should the parasite be found in Scottish waters. It will be necessary to define the distribution of infection, contain the infection to the area of occurrence and, if practical, seek to eradicate the parasite from Scottish waters

Detection and Diagnosis

2.15 Over 400 species of *Gyrodactylus* have been described. Many can be easily distinguished but *G.salaris* has a remarkable variety of morphological features and shows a degree of overlap with another species that is harmless to salmon, *Gyrodactylus thymalli*. Methods in routine use can identify this complex but there is still some debate regarding the status of species within this complex. A decision tree for the identification of *G. salaris* is at Annex 4 of the Operations Manual.

2.16 Detection and diagnosis of *G. salaris* will be based on the principles and guideline recommendations detailed in the most recently updated version of the OIE Diagnostic Manual for Aquatic Animal Diseases. Specific diagnostic methods employed will conform to these principles, will be based on a thorough and scientifically rigorous validation prior to adoption and will be capable of standing up to independent scientific peer review.

2.17 A description of the biology, sampling procedures and diagnostic techniques for *G. salaris* are presented in the OIE Manual of Diagnostic Tests for Aquatic Animals and key reference publications are also listed there.

2.18 The Expert Group on *G. salaris* will provide the most recent definitive information on aspects of the biology of the parasite, the disease caused by it in Atlantic salmon, its diagnosis and control methods.

Suspicion of the Presence of *G. salaris*

2.19 Marine Scotland Science (MSS) and its component departments will be responsible for investigating any suspicion of *G. salaris* in Scottish waters.

2.20 MSS will be responsible for serving and enforcing disease control notices, for taking samples, providing a diagnostic service and carrying out epidemiological investigations. MSS will advise the Disease Strategy Group (DSG) on issues relating to containment and eradication. MSS is responsible for producing and maintaining an Operations Manual. The current version is located at Appendix 11.

2.21 This Contingency Plan deals with the actions to be taken when *G. salaris* is suspected in Scottish waters and the actions when the presence of the parasite is confirmed. There will also be instances when *G. salaris* will be considered as a potential diagnosis along with several other diseases and/or conditions. This plan will not normally be implemented until such investigation suggests that the likely cause is *G. salaris.* Each case will, however be judged on its merits and in certain circumstances movement controls may be imposed before a strong suspicion of *G. salaris* is suggested.

2.22 Grounds for investigating the potential presence of *G. salaris* may be raised by any or all of the following circumstances:-

- Unexplained mortality or sudden loss of Atlantic salmon populations particularly the parr and fry stages.

- The unexplained absence of juveniles in areas where they were previously plentiful.

- A claim by anyone, other than a person with a credible knowledge of fish disease, that *G. salaris* has been found or suspected.

2.23 Grounds for suspicion of the presence of *G. salaris* may be aroused by any or all of the following circumstances:-

- A positive result arising from any of the investigations carried out in circumstances listed in 2.22 and 2.23 above.

- Mortality accompanied by gyrodactylid parasites and/or lesions characteristic of Gyrodactylosis.

- The known legal or illegal introduction of live susceptible fish species or objects capable of carrying the parasite, from farms, zones or countries at risk from *G. salaris*, into direct contact with susceptible species of fish in Scottish waters.

- A claim by a person with a credible knowledge of fish disease that *G. salaris* has been found.

2.24 In all of the above situations movement restrictions will be immediately imposed and only removed following receipt of negative laboratory results and a risk assessment by the Epidemiology team.

2.25 Such suspicion will always prompt the immediate further investigation of the susceptible fish populations in the area of suspicion by the Fish Health Inspectorate (FHI) and laboratory analysis. The area of suspicion could include the whole catchment or even adjacent catchments if water transfer is practised or the water conditions between adjacent river mouths is suitable to allow the potential transfer of viable parasites. Fisheries Trusts have a programme of stock assessment, sampling expertise and electro-fishing equipment that could be useful in these investigations.

2.26 If suspicion arises where the natural population of salmon is low, consideration will be given to the use of caged sentinel salmon parr as a means of increasing the numbers of susceptible hosts and thus facilitating diagnosis. Such situations may arise if there is a suspicion of the parasite occurring in waters containing rainbow trout.

2.27 **Confirmation of disease** will be made when a positive laboratory identification of *G. salaris*, made by the National Reference Laboratory for Fish Diseases at MSS Marine Laboratory. Samples from a first positive case and periodically thereafter will be submitted to the OIE Reference Laboratory for *G. salaris* for corroboration. Full containment measures will be immediately imposed if they have not been implemented on suspicion. Action to be taken with movement restrictions are covered in section 4 of the Operations Manual at pages

132-133. These measures will only be removed when scientific evidence indicates that *G. salaris* is no longer present in the catchment /farm.

2.28 The Head of NDCC is responsible for informing the Head of DSG of all positive results by the most expeditious means available. The Head of DSG must ensure that there are named contacts to whom results can be notified out of hours.

Detailed actions for further investigations, containment and eradication are set out on the Operations manual at Appendix 11 (See page 123 onwards)

Support from major stakeholders

2.29 Major internal and external stakeholders have been involved in the preparation of this plan (s*ee Appendix 2).* It is anticipated that they will continue to be involved in reviews and exercises to test its robustness.

2.30 In the event of an outbreak, internal stakeholders will work in close cooperation with the Disease Strategy Group (DSG) and Local Disease Control Centre (LDCC) managers. External Stakeholders will assist as major communication avenues between all parties affected by the outbreak and the Scottish Government. Major stakeholders may be able to provide additional staff and expertise (See Appendix 2 page 36). At local level they will assist LDCC management to resolve local problems by acting as intermediaries and providing local knowledge.

3. Command and Control—Management of Disease in Scotland

3.1 The disease will be managed in Scotland by the Disease Strategy Group assisted by the National Disease Control Centre (NDCC). They will draw on expertise from a large number of other groups within the Scottish Government and representatives of the major organisations affected. In order to ensure rapid coherent responses between policy and field operations the head of NDCC will be a member of DSG. A senior member of Marine Scotland will also maintain close liaison with head of NDCC.

An organogram showing the command and control structure is given at Appendix 6, Annex 1.

3.2 The roles of the major players are outlined below with detailed actions and management structures being described in the relevant appendices.

Role of Diseases Strategy Group (DSG)

3.3 The Disease Strategy Group (DSG) will be responsible for the overall control of the outbreak in Scotland. The group will be responsible for:-

- Developing, determining and interpreting policy within the legislative framework,
- Setting the overall objectives for the disease control operation,
- Managing and coordinating actions taken by NDCC including receiving reports from NDCC and Expert Group and deciding on further actions for surveillance, containment and eradication strategies,
- Informing and advising Ministers on all aspects of the outbreak,
- Liaising with Defra and devolved administrations (NB Defra have responsibility to liaise with EU and OIE),
- Linking with Scottish Government Emergency Room (SGER),
- Liaising with relevant Scottish Agencies,
- Ensuring that the Communications Strategy is implemented and ensuring that all External and Internal Stakeholders are kept informed ,
- Decide on priorities in conjunction with NDCC when, for example, there are two concurrent Notifiable diseases in Scotland,
- Making provision for additional equipment, accommodation and staff to be provided to deal with the outbreak and
- Ensuring that all work is carried out with due regard to current risk assessments or if none exist that assessments are prepared and staff are aware of details before undertaking new work. DSG may delegate Health and Safety issues to the Heads of NDCC and LDCC.

3.4 In the event of several foci of disease at the same time the DSG may consider setting up Local Disease Control Centres (LDCCs) under the overall control of NDCC. It is envisaged that these units would act as forward field stations with diagnosis, epidemiology and administration retained at NDCC.

(See Appendix 6 "Command and Control Section" (page 88) and Appendix 11 "Operations Manual" (page 123))

Role of the National Disease Control Centre (NDCC)

3.5 The NDCC will:-

- Be responsible for ensuring that all relevant field and laboratory work is carried out to meet the overall objectives for the disease control operation set by DSG,
- Be responsible for receiving all reports of suspicion of disease and arranging for the necessary sampling and restriction regimes to be put in place,
- Be responsible for providing DSG with scientific support and information to advise policy, assist in setting objectives and ensuring that all publicity material, press releases etc are timely and accurate,
- Have responsibility for sending material to the OIE reference laboratory for confirmation of *G. salaris*,
- Report to DSG on regular basis,
- Set up local Stakeholder Groups,
- Provide a response, in conjunction with the Scottish Government Communications Directorate, to media requests for local information and
- Ensure that all work is carried out according to Health and Safety risk assessments (see para 3.3 above)

3.6 On receipt of information indicating grounds for suspecting the presence of *G. salaris* in Scottish waters, the NDCC will be immediately established to evaluate the level of suspicion of the presence of *G. salaris.* When it is concluded that the grounds are reasonable, the Head of the NDCC will immediately advise the Head of the DSG and the Chairman of the *G. salaris* Expert Group of the information obtained.

3.7 The Head of the NDCC will advise the DSG on the level of containment considered proportionate to the level of risk. A positive diagnostic result for *G. salaris* from the National Reference Laboratory for Fish Diseases for Scotland, obtained prior to confirmation from the OIE Reference Laboratory for *G. salaris* will initiate implementation of the full containment plans of a *G. salaris* confirmed situation (paragraph 2.27 above).

Role of the Expert Group

3.8 Upon confirmation or suspicion of *G. salaris* or during any period of heightened threat from *G. salaris*, the head of the NDCC may instruct the establishment of a *G. salaris* Expert Group. The Expert Group will be chaired by a representative from MSS and will include other MSS staff members with suitable scientific knowledge or experience, as well as external individuals considered experts in relation to the detection, control and eradication of *G. salaris*. The expert group will be available to provide information on any developments, scientific or other, relating to surveillance, epidemiology, diagnostics, containment and eradication of *G. salaris*. The Expert Group may also be able to assist with any training needs which have been identified within the NDCC.

Strategic Co-ordination Groups (SCG)

3.9 There is an SCG for each of Scotland's eight police areas, which co-ordinates the responses of blue-light emergency services, local authorities and other relevant partners. The main focus of these groups is to coordinate actions in major emergencies. A widespread outbreak of *G. salaris* could fit into this category. Each SCG has groups at the strategic, tactical and operational levels. The SCGs will be notified by the Head of NDCC in the event of a confirmed outbreak of *Gyrodactylus salaris* via the local police control centre, who will notify members.

SCGs will work at all levels with the NDCC in managing the consequences of the isolation of *Gyrodactylus salaris.*

3.10 Membership of SCG is all Category One responders as defined by the Civil Contingencies Act 2004, plus others as appropriate. In the event of an outbreak of *Gyrodactylus salaris* membership will be:
• Police
• Local Authorities
• Health Boards
• SEPA
• Utilities
• Local Enterprise Companies

3.11 SCG will be responsible for:
- Handling public and press pressures at the locus.
- Co-ordinating consequence management of disease outbreak.
- Policing any movement restrictions.
- Liaising with DSG on policy matters

Role of other Groups in control of *G. salaris*

3.12 A range of other groups are involved in the control of an outbreak of *G. salaris.* They include Scottish Government, External Enforcement Bodies and Stakeholders. The groups are listed below with roles and responsibilities being detailed in Appendix 2.

3.13 Scottish Government Groups

- Marine Scotland including Marine Scotland Science
- Communications Directorate
- Human Resources Services
- Finance Directorate
- Scottish Government Procurement
- Information Services and Information Systems (ISIS)
- Geographic Information Science and Analysis Team (GI-SAT)
- Economic Impact Assessment Group
- Natural Resources Division
- Drinking Water Quality Division
- Environmental Quality Division
- Animal Health and Welfare Division
- Rural Payments and Inspections Directorate
- Staff Welfare Officer
- Health and Safety Officer
- Scottish Government Legal Directorate

3.14 External Enforcement and Advisory Bodies

- Local Authorities
- Police
- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- Association of Salmon Fishery Boards
- District Salmon Fishery Boards
- Water Baliffs
- Scottish Water

3.15 Other Groups

- National and Local Stakeholder Groups
- Fish Vets Society
- Rivers and Fisheries Trusts Scotland (RAFTS)
- Scottish Salmon Producers' Organisation
- British Trout Association
- Scottish Anglers' National Association
- Scottish Federation for Coarse Angling
- Atlantic Salmon Trust
- Salmon and Trout Association
- Scottish Fisheries Co-ordination Centre
- Ordnance Survey
- Hydro Electric Industry
- Scotch Whisky Industry
- Sportscotland representing Leisure Industry
- Scottish Canoe Association
- Scottish Society for the Prevention of Cruelty to Animals (Scottish SPCA)
- Visit Scotland

Links to Over-arching Civil Contingencies Structures

3.16 The over-arching structures for civil contingencies are set out in *Preparing Scotland: Guidance on Preparing for Emergencies.* This provides for the links between the Scottish Government and key responders to any emergency.

The DSG can link through internal Scottish Government structures to the Scottish Emergency Co-ordinating Committee (SECC) via the Scottish Government Emergency Room (SGER), which will also link them into the Emergency Action Team and the Ministerial Groups. The SECC has a role in both preparing for and responding to specific emergencies. This is a core group of the most senior officers from each of the responding agencies and representatives of the Scottish Government, the exact membership to be determined by the nature of the emergency.

3.17 The DSG should also link to the SCGs (See para 3.9 above) at a strategic level, with each group identifying joint or liaison members. This link is of critical importance; the DSG will lead on the disease management while the SCGs will lead on all non-fisheries operational aspects. The relationship is thus one of dual control and the inevitable overlaps should be managed through communication. The NDCC will link directly into the SCGs and liaise at all levels on all matters of common concern.

3.18 It should be noted that, unlike for most civil emergencies, in the event of a notifiable disease of fish the lead bodies are not the emergency services. The response will be led for Scottish Government by the Marine Scotland. The importance of direct relations at all levels and the avoidance of intra-organisational communications only being conducted at higher levels is paramount.

Operations Manual

3.19 The Operations Manual to deal with an outbreak of *G. salaris* is located at Appendix 11 (page 123). It is drawn up and maintained by MSS and covers the roles and responsibilities of key players and organisations, job descriptions and the actions to be taken to control the disease by whichever method the Minister shall decide.

Responsibilities and Job Descriptions of Lead Players

3.20 It is vitally important for the success of any control programme that the Lead Players understand their individual roles and where they fit into the control system. Current Post Holders have been allocated specific roles in this plan. It is intended that line managers incorporate these duties into routine job descriptions and encourage staff to review them on a regular basis.

3.21 The roles and responsibilities are detailed in Appendix 6 (page 88)

Training Policy

3.22 Staff cannot be expected to perform effectively without being given training and support in the tasks they are expected to perform. To meet these aims line managers must discuss training needs with individual staff members and allow time and budgetary resources for effective training.

3.23 Core Competencies of relevant staff must be identified and suitable training given to fulfil any identified need. This may involve secondments to assist in other countries or using Norwegian experts to provide training in Scotland.

3.24 In order to ensure a coherent response to a disease outbreak this plan will be tested periodically by either a desk top or field exercise. This testing will include all the agencies who will be involved in the control of an outbreak.

4. Scottish Government Headquarters Structures & Responsibilities

Marine Scotland

4.1 Marine Scotland, consists of three groups that are responsible for all policy, operational and funding matters relating to *Gyrodactylus salaris*.

The three groups are:

- Performance and Aquaculture Division including Aquaculture Policy, Aquaculture Health and Welfare and European Funding
- Salmon and Recreational Fisheries Team
- Marine Science Scotland including Fish Health Inspectorate and Freshwater Laboratory

An organo-gram showing the structure of Marine Scotland, is given at Appendix 6 Annex 2 (page 95).

Performance and Aquaculture Division

4.2 In the operation of this Contingency Plan Performance and Aquaculture Division will have responsibilities for:-

- Providing staff to DSG and NDCC,
- Liaison with Scottish Government Legal Directorate,
- Ensuring that DSG and NDCC are kept fully briefed of developments and issues so that they can meet the requirements of the communications strategy (see Appendix 5 page 72),
- Dealing with requests from DSG for necessary additional resources and
- Developing and advising on policy in relation to *G.salaris* control.

Fisheries Division

4.3 In the operation of this Contingency Plan Fisheries Division will have responsibilities for:-

- Cross Border issues liaising with Defra and DSFBs for Tweed and Border Esk,
- Hydro-electric and other water transfer issues in conjunction with SEPA, Scottish Water, electricity generating Companies and Distilleries,
- Advising on wild salmon and freshwater fisheries policy issues and
- Matters relating to conservation, ecology and wildlife policy including gene banking and restoration in conjunction with Freshwater Laboratory and DSFBs.

Marine Scotland Science (MSS)

4.4 Marine Scotland Science is the section within Marine Scotland that is responsible for implementing and enforcing the control measures for *G. salaris* in Scotland. It is also responsible for producing and maintaining the Operations Manual that is contained at Appendix 11 (page 123) and ensuring that its own staff and staff on secondment are trained and fully conversant with the plan. MSS will need to liaise closely with DSG and Marine Scotland Performance and Aquaculture Division in relation to service of notices, advice to Ministers and media issues.

4.5 The MSS Freshwater Laboratory is responsible for advising Scottish Government and Ministers on freshwater fish and fisheries. The laboratory has specific expertise on gene banking and water chemistry. Staff also have the skills to sample fish and fish populations and to advise on the design and installation of barriers should an eradication plan be considered.

Rural Payments and Inspections Directorate

4.6 The Rural Payments and Inspections Directorate has a large cadre of staff who are conversant with contingency procedures for other diseases. They also have a large body of local data and knowledge that will be relevant to control procedures and their wider effect on the countryside. The group is thus well placed to provide additional staff resources both at management and field operative level.

Animal Health and Welfare Division

4.7 Animal Health and Welfare Division is part of the Rural Group within the Scottish Government. It is responsible for advising on the disposal of fish and fish waste. The Veterinary Team within the Division may also be able to provide advice on the welfare of fish during containment and slaughter.

5 Field Operations

Operations Manual

5.1 The Operations Manual will form the core instruction to staff on how to deal with:-

- suspicion of disease,
- confirmation of disease,
- movement restrictions,
- field investigations,
- epizootic investigations,
- diagnosis,
- eradication and
- demonstrating freedom from disease.

Local Plans

5.2 Local Plans, to deal with disease in specific catchments, will be developed by MSS to guide the implementation and enforcement of containment and eradication measures. They may relate to a single catchment or to groups of catchments depending on size, geographical location, and ease of access and location of suitable premises from which to operate. An example of a specific catchment plan, used in Norway, is provided in Appendix 12 (Page 180) as a template for developing catchment specific plans when needed. The creation of such plans will be guided by the extent of disease as determined by epidemiological investigation after disease is confirmed. Local plans will need to specify who does what at a local level. The aim will be to ensure that best use is made of the skills available irrespective of the discipline or organisation of the individuals involved.

National Disease Control Centre

5.3 The occurrence of suspicion of the presence of *G. salaris* will result in the NDCC being established at MSS in Aberdeen.

Structure of NDCC plus resources required

5.4 A schematic structure with a list of resources required is given in the Operations Manual. It is the responsibility of MSS to develop this structure for specific disease situations taking into account the scale of the problem in the specific catchment(s) and the resources available.

Composition and Structure of Management Group of NDCC

5.5 The composition and structure of the management group is given in the Operations Manual (page 123) together with job descriptions for the lead players. Additional responsibilities may be added by the NDCC Manager depending on how the outbreak develops. It may be possible for one individual to take the lead in more than one area.

Work Allocation

5.6 In the initial stages of an outbreak it is likely that the number of staff involved will be small and normal procedures for allocating and auditing work will suffice. However as the outbreak develops there will be much additional work and it is essential that a system is set up to ensure that all work is allocated according to priorities. The work must be tracked through the system and audited on completion. The NDCC Manager will delegate one member of staff to oversee this work.

Action Flow Charts

5.7 It is essential to ensure that all work and any follow up actions are completed. Action Flow Charts can be adapted to deal with local and unforeseen circumstances to ensure that no required actions are overlooked.

Actions to contain disease

5.8 The distribution of the parasite will be unknown when the first case is discovered. It is important, for overall control, that movements of fish are restricted until parasite distribution is determined. To this end a Scotland-wide standstill will be considered with a licensing provision based on risk assessment to cover essential movements. Irrespective of whether or not a national standstill is imposed any farms or catchments identified, through forward or backward contact tracing, will be placed under restrictions until investigation shows that the parasite is no longer present. It may still be prudent to maintain containment measures to reduce the risk of any further spread of Gs.

5.9 Once the presence of *G. salaris* is suspected, action must be taken to contain the spread of the disease within the catchment, between catchments and between farms. This will be achieved by serving restrictions under the powers contained in regulations 24 to 31 of the Aquatic Animal Health (Scotland) Regulations 2009. The requirements and provisions of regulations 32-34 will be incorporated into written notices as required. The relevant notices are Initial Designation Notices (IDNs) which are used on suspicion that disease is present and Confirmed Designation Notices (CDNs) which are used when disease is confirmed. Both IDNs and CDNs may be used to control the movement of live fish, eggs, fish feed, equipment, materials and people .

5.10 Where disease is so widespread throughout the country that containment is no longer considered feasible, either movement of live fish, eggs and fish feed may be permitted in accordance with the terms of a CDN, or where it is considered that a CDN can no longer serve a practical purpose it may be withdrawn or the conditions relevant to it may not be enforced.

Actions to eradicate disease

5.11 If disease is confirmed the DSG will prepare a report for Ministers giving recommendations as to whether they consider that eradication is a feasible possibility in the circumstances that exist at the time of confirmation.

5.12 In arriving at a decision the DSG will take account of information provided by relevant bodies as per the details given in Appendix 2 (page 36) and the policy objectives and

legislative basis for action detailed in sections A & B of this plan. If the final decision is that eradication is not feasible and/or justified the DSG will consider what enhancements (if any) are required to the containment measures, already in place, to minimise the impact of this disease.

Protection of Genetic Lines

5.13 Before eradication is proposed the catchment will be surveyed to decide whether it is feasible to preserve genetic lines. This can be achieved by holding brood fish in captivity to rear progeny, in quarantine, until such time as the catchment can be restocked. Alternative stock rebuilding strategies can be considered at this stage. (Details on gene banking and restoration are given at Appendix 9 - page 113)

5.14 When Gs is confirmed in a river system, a gene banking and restoration steering group (GBRSG) should be established immediately, with representatives from MSS and local fisheries interests such as DSFBs, Trusts, etc.

5.15 The GBRSG should formulate and implement a plan for the capture of Atlantic salmon brood stock from potentially infected populations at the first possible opportunity. This should encompass the production and quarantine of fertilised eggs and the cryopreservation of sperm, and identify secure, disease free rearing facilities, where the living and frozen material will be gene banked. Fertilised eggs from disease free parents will be used to establish family lines in the facilities, which can then be used for the production of eggs for restocking.

5.16 When a plan for Gs eradication is developed, gene banking needs for other affected species populations, if any, will need to be identified, facilities put in place, appropriate brood stock collections carried out, and restoration plans developed.

5.17 The basic issues and considerations surrounding gene banking and restoration work are detailed in Appendix 9(page 113).

Staffing requirements

5.18 In a worst case scenario many catchments may be affected when the first case is confirmed. There could, therefore, be a need for a major increase in staff, inspectors, laboratory facilities and resources. It will fall to Head of DSG in consultation with Scottish Government colleagues to identify and supply these resources. This plan sets out the management structures required to manage an outbreak or series of outbreaks.

5.19 MSS is responsible for deciding the staff requirements for disease control measures in a particular catchment. They will need to liaise with DSG and Marine Scotland when eradication proposals are being drawn up to ensure that sufficient trained staff are available either from within the Scottish Government or from outside contractors.

5.20 Marine Scotland is responsible for ensuring that sufficient trained staff are available to deal with the increase in policy and administrative work that an outbreak will generate.

6. Communications

Scottish Government Communications Strategy Policy

6.1 The, then, Scottish Executive developed a Communications Strategy in 2002/3 following on from the "Lessons Learnt" reports after the Foot and Mouth outbreak in 2001. This strategy was used to formulate a plan to deal with communications in future outbreaks of exotic disease. This plan will adapt the policy to suit the needs of communications in a disease situation that is expected to move more slowly and also over a much longer time scale.

6.2 It is essential that all participants in the control programme are aware of all relevant information. To ensure that information is fully circulated a Communications Coordinator will be appointed immediately. He/she will be responsible for ensuring that the communications strategy is fully implemented (Job description at Appendix 6-page 88)**.** He/she will need to be aware of local issues that may be being dealt with by local agencies. Until such time as a Communications Coordinator is appointed the task will form part of the remit of the Head of DSG in consultation with Head of NDCC and Communications Directorate.

Internal up and down "Chain of Command"

6.3 Tight communication and coordination of activity is essential to a successful disease control process. When a suspected case is first reported the Head of DSG will brief the Minister and senior management including the Director of Communications. MSPs/MPs with a constituency interest will also be alerted. Arrangements will be put in place in case disease is confirmed.

6.4 It is for each manager in the chain to decide which staff need which pieces of information BUT the information flows must be proactively managed to keep staff informed. The Head of DSG will appoint a Communications Co-ordinator who will be responsible for ensuring that all managers (HQ, Field and Laboratory) are made aware of policy and decisions that affect their role. Similarly each manager must produce a regular report to DSG on relevant actions within their unit.

6.5 The Communications Coordinator will develop communication strategies, in consultation with managers, to take account of the stage and scale of the outbreak. Full details of Communications Issues and Strategy are given in Appendix 5 (page 72) which should be consulted whenever guidance is needed.

Media Briefing Policy

6.6 The Communications Directorate will lead in dealing with the media and in handling requests for interviews and media briefings. Communications Directorate will decide, in consultation with Ministers and DSG, whether any particular situation warrants a formal media briefing. NDCC will also be consulted on local issues. Local organisations will also be involved in dealing with local issues through their own media handling facilities.

6.7 The aim of briefings will be to pass information to the general public and to relay a coordinated message. Staff will also have to deal with concerns raised by media personnel so

will need to be fully briefed. Communications Directorate will thus liaise closely with the press offices of other involved agencies to ensure that information is shared and best use is made of available media time.

Provision of information on disease status and proposed action

6.8 The Scottish Government's policy, in dealing with information on cases of suspect or confirmed disease, has been that it will not normally name locations. However the Environmental Information (Scotland) Regulations 2004 requires Scottish Public Authorities to make environmental information available unless the situation is covered by an exception to provide the information and where there is provision in the legislation to respect the confidentiality of the information. Legal opinion, in 2006, is that neither caveat appears to apply to an outbreak of *G. salaris* and the Scottish Government would have to release the information if requested. If such requests are received legal advice will be sought before a decision is made.

6.9 It may be essential to the disease control strategy that stakeholders are given as much information as possible to enable them to implement measures to reduce the risk of disease spread. When a suspect case is confirmed the location may be publicised together with a briefing document setting out the actions that will be taken to contain and/or eradicate the parasite.

Publicity to industry and related users

6.10 The Scottish Government, Marine Scotland will, as part of its ongoing preventative programme, continue to issue advisory leaflets on fish diseases and their prevention. A DVD has been produced based on lessons learnt in Norway and is available from Marine Scotland Area 1B North Victoria Quay EDINBURGH EH6 6QQ Once disease is suspected and/or confirmed, the Scottish Government, Marine Scotland, will communicate with all stakeholders by letter and/or e-mail to keep them up-dated on the stage of the disease.

6.11 Stakeholder Groups will meet at National and Local level and be responsible for assisting in keeping their members informed.

6.12 Various bodies e.g. Police, COSLA, SEPA, Riparian Owners, DSFBs, may be able to help by displaying notices at strategic points. Advice can be sought from the Strategic Co-ordinating Group for the areas affected (see paras 3.9 & 3.10)

6.13 A strategy will be developed to use web-based information as part of the communications policy adopted.

Help/Information Lines

6.14 It is likely that there will be many requests for information in the event of a disease outbreak. The provision of such information is very time consuming and has the potential for diverting staff from managing and controlling the outbreak. The Communications Coordinator will be responsible for setting up a helpline to deal with requests for information. A National Helpline will be staffed by MSS staff and briefing will be supplied by Communications Coordinator in consultation with Head of DSG. The Resilience Team may be able to assist. At local level use will be made of other enforcement bodies who will be

asked to cooperate in staffing a multi discipline Help Line. A draft briefing document is provided in the Operations Manual (Annex 6a-page 164)**.** Additional information will be added in response to questions received and developments in policy and control measures. The information being given out should be in accord with similar information being given out in rest of UK but will also need to reflect specific Scottish issues.

6.15 If help lines are set up by outside agencies/organisations the Communications Co-ordinator should try to ensure that messages are consistent. Ideally there should only be one help line but staffed by a multi disciplined group of staff.

Response to correspondence

6.16 All correspondence needs to be handled so that responses meet Scottish Government targets. Responses also need to be consistent with current policy.

6.17 To meet these two targets all correspondence, on policy issues, will be replied to from a central unit staffed by staff from the Marine Scotland. Correspondence on operational matters will be the responsibility of the Head of NDCC who may delegate a senior member of staff to respond on his/her behalf. Correspondence that relates to the roles and responsibilities of non Government agencies should be acknowledged and passed to the appropriate agency to respond.

Web site

6.18 A *Gyrodactylus salaris* web page will be drawn up for inclusion on the Scottish Government website providing core information and contact points. This web page should be drawn up in advance and be ready to operate at a moment's notice. Consultation with Defra will be needed particularly on UK and EU issues. Relevant organisations will be asked to include links on their web sites.

7. Resources

Provision of Accommodation/Staffing

7.1 Head of DSG will be responsible for ensuring that there is adequate accommodation and staff resource to enable the outbreak to be controlled successfully. He/she will be responsible for developing agreements with other Scottish Government departments and external agencies to ensure that resources are available. (See Appendix 8-page 101)

Implementation of Operations Manual

7.2 The implementation of the Operations Manual is the most resource intensive part of any control programme. The Head of NDCC is responsible for setting up the NDCC and implementing the Operations Manual and any subsequent plans to deal with specific catchments. He/she will decide on the specific resources required for each phase of the operation and advise the Head of DSG of requirements. (See Appendix 11-page 123)

Information Technology/ Telephones etc

7.3 ISIS will be responsible for the provision of all additional IT requirements. The Division will be responsible for arranging for the provision of IT support in stand alone LDCC(s) if required (see P14 para 3.4) and for ensuring that support in existing units is sufficient.

7.4 ISIS will be responsible for the provision of extra telephone equipment including the provision of the help lines.

Procurement & framework agreements/call off contracts

7.5 Scottish Government Procurement will develop framework agreements/call off contracts for use by Local Authorities, other agencies and external contractors for the provision of goods and services in the event of an outbreak. Scottish Government Procurement will also be responsible for procuring additional goods and services for use as the control measures are developed. Ordering procedures must ensure that the ownership of these goods/services remains with the Scottish Government, irrespective of who places the order.

Laboratories

7.6 The Head of MSS will ensure that there is sufficient trained staff to deal with the likely diagnostic capability. He/she must also ensure that all field staff are trained in correct procedures for taking samples, packing and despatching same to laboratories and reporting necessary epidemiological data to Head of Laboratory. Procedures must also be in place for formal reporting of suspicion of disease and despatching samples to OIE reference laboratory.

7.7 The Head of MSS will consult with Heads of other approved laboratories on a regular basis to determine the capacity of currently approved laboratories. He/she will make contingency arrangements for dealing with testing that is above the capacity of approved laboratories at MSS.

Appendix 1 – Summary of Legislation Affecting Control of *Gyrodactylus salaris.*

The aim of this appendix is to draw together a summary of the EU, UK and Scottish legislation that may have to be considered when dealing with an outbreak of *Gyrodactylus salaris.* In the event of apparent conflict between legislation Scottish Government Legal Division will be consulted. The appendix is divided into four sections for ease of reference but it should be borne in mind that there may be more than one piece of legislation impacting on a particular issue.

This appendix includes changes consequent on the transposition of the EU Aquatic Animal Health Directive (2006/88/EC) through the Aquatic Animal Health (Scotland) Regulations 2009.

Legislation relating to Aquaculture, Fish and Fisheries

1. The Aquatic Animal Health (Scotland) Regulations 2009.(SSI 2009/85)

1.1 The Aquatic Animal Health (Scotland) Regulations 2009 Part 4 details the actions to be taken in respect of Notification and Control of Disease Outbreaks. They oblige the competent authority (Scottish Ministers) to designate waters when the authority suspects or confirms a listed disease may be/is present. *G. salaris* is a listed disease in these regulations. Such designations must be in the form of a written notice—an Initial Designation Notice (IDN) is used on suspicion of disease and a Confirmed Designation Notice (CDN) on confirmation of disease

1.2 The competent authority may authorise any person to be an inspector for the purposes of these Regulations.

1.3 IDNs and CDNs must describe the area which is the subject of the designation, describe the circumstances in which a person commits an offence and makes reference to any consents given in respect of the movement of aquatic animals and the disposal of any dead aquatic animals from the designated area.

1.4 IDNs and CDNs may require restrictions on the movements of any equipment, material or substance liable to transmit disease and on any means of transport liable to transmit disease.

1.5 With specific reference to *Gyrodactylus salaris* the Regulations provide additional powers, in Part 5, permitting the competent authority to:-

- Create, maintain, dismantle and remove barriers to the movement of aquatic animals
- Treat with chemical agents any water in a designated area
- Direct the withdrawal of all aquatic animals from a farm
- Direct the draining, cleaning and disinfection of all pools and cages on the farm
- Direct the destruction of all dead aquatic animals and all live animals showing signs of gyrodactylosis or of contamination with *G. salaris.*
- Direct the cleaning, disinfection and/or destruction of any equipment, material or substances liable to be contaminated with *G. salaris.*

- Take any other measures as it considers appropriate for the purpose of eradicating or preventing, or limiting the spread of *G. salaris.*
- Compulsorily access and inspect any land or premises. Entry to a dwelling requires a warrant issued by a Justice of the Peace.

1.6 The Regulations extend to all aquatic animals in any Scottish water so cover those parts of the Tweed and Border Esk which lie in Scotland.

1.7 The Regulations repealed the Diseases of Fish Acts 1937 & 1983 and the Diseases of Fish Regulations 1984

2. The Aquaculture and Fisheries (Scotland) Act 2007

2.1 Section 36 of the Act permits Scottish Ministers to make payments in respect of any fish destroyed in pursuance of the exercise of such powers as the Scottish Ministers may specify by order.

2.2 Any order made under the above section may include provision regulating applications and the method of payment. The order may also include the amount payable, the basis on which the amounts are ascertained, the conditions which must be met for payments to be made and the circumstance in which payments may not be made. No payments can be made unless the necessary order is in place.

3 The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003.

3.1 The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 provides for the establishment of salmon fishery districts, the formation of boards, the employment of water bailiffs and wardens and the use of otherwise unlawful methods to catch fish.

4. Commission Decision 2010/221/EU (O.J. No. L 98, 20.4.2010, p7-11)

4.1 Commission Decision 2010/221/EU was made under article 43 of Council Directive 2006/88/EC.(O.J. No L. 328, 24.11.2006, p14-56) which offers provisions for limiting the impact of diseases not listed within that Directive. Protective measures against trade in infected fish are granted dependent upon a programme of control and eradication in relation to any outbreaks of *G. salaris*.

4.2 National measures for United Kingdom are approved through Commission Decision 2010/221/EU which limit the impact of *G. salaris* in aquaculture and wild aquatic animals in the UK. The UK can take protective measures in relation to the introduction of live salmonids and salmonid ova from areas infected by *G. salaris*. It should be noted that introductions can take place from a country that has *G. salaris* in some of its fish stocks providing that the introduction is either from a disease free zone, or where the consignment originates from a zone not declared free either ova have been disinfected to a suitable standard prior to packing or fish have been held in water of a salinity greater than 25 ppt for at least 14 days prior to dispatch. The consignment must be accompanied by a health certificate in accordance with Commission Regulation 1251/2008,(O.J. No L337, 16.12.2008, p41-75) as amended.

5. The Animal By-Products (Scotland) Regulations 2003.(SSI 2003/411)

5.1 EU Regulation 1774/2002 implemented by the Animal By-Products (Scotland) Regulations 2003 which sets out the permissible ways of dealing with various categories of animal waste.

5.2 Dead farmed fish that are infected with *G. salaris* would be classified as Category 2 by-products and the route of their disposal to an approved disposal site would be subject to supervision by MSS and/or Local Authority Inspectors.

5.3 Dead fish affected with *G. salaris* may be disposed of by rendering, incineration and in certain specific cases by burial.

Legislation relating to the Environment

6. The Water Framework Directive 2000/60/EC (WFD) (O.J. No L327 22.12.2000 p1-73), the Groundwater Directive 2006/118/EC (O.J. No L348, 24.12.208, p84-9) and the Priority Substances Directive (2008/105/EC) (O.J. No l372, 27.12.2006, p19-31)

6.1 The WFD and its daughter Directives apply to all water bodies including lochs, rivers, coastal and transitional waters and ground waters, and aim to protect and improve the water environment, taking into account relevant social, economic and wider environmental issues. To do so, the WFD introduces a framework of river basin management planning. The Directive is transposed in Scotland by the Water Environment and Water Services (Scotland) Act 2003 (WEWS);

6.2 Prior to the introduction of WFD, a number of EU Directives introduced requirements for the protection of certain aspects the water environment and its ecology. Our legal framework for implementing the WFD brings together many of these various components into a single legal framework.

7. The Water Environment and Water Services (Scotland) Act 2003 (WEWS); and The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) (SSI 2005/348)

7.1 The WEWS Act provides the legal framework for introducing river basin management planning and its delivery in Scotland, and places responsibilities on public bodies to take account of the aims of the WFD when carrying out their normal statutory duties.

7.2 The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) which were made under WEWS provide a regulatory framework for controlling a wide range of activities which may impact upon the water environment in Scotland, such as discharges, abstractions, impoundments, and river engineering activities.

7.3 Ministers have an over-arching duty to comply with the requirements of the WFD and approved the first River Basin Management Plans (RBMPs) in December 2009, which set challenging targets for improving Scotland's water environment and its ecology. Thus, in

terms of fish farming and the implementation of this contingency plan, those requirements will need to be considered in the following circumstances:

- Proposals to use rotenone, aluminium sulphate or other chemical treatments to deal with an outbreak of *G. salaris* will require to be considered in line with the authorisation provisions of CAR

- Proposals to construct barriers to impede the passage of migratory fish may require to be considered in line with the authorisation provisions of CAR

- Proposals to divert watercourses or suspend authorised abstractions will need to be considered in line with the licensing provisions of CAR. This includes the temporary cessation of any authorised transfer of water between catchments.

7.4 Currently all applications for authorising the above activities will need a full risk assessment. This may take up to four months and it is thus important that SEPA are involved at an early stage in the planning cycle.

7.5 In emergencies, the normal CAR process would create unacceptable delays. Scottish Government has therefore introduced further provisions in the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR 2011) to ensure sufficient flexibility to respond to the need for swift but temporary action in such circumstances.

8. Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (SI 1994/2716) – Part IV

8.1 Protected Sites (Natura 2000): Part IV of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the "Habitats Regulations") transpose the requirements of Article 6.3 and 6.4 of the EC Habitats Directive (Council Directive 92/43/EEC [O.J.No. L206, 22.7.92, p7-50) This Directive aims to maintain or restore certain natural habitats and wild species to "favourable conservation status" and includes, along with the Birds Directive, the requirement to designate areas to provide secure protection for certain habitats and species. Sites designated under these Directives form a pan-European network known as "Natura 2000". If action to eliminate *G. salaris* is being considered which might have an effect on a Natura site (regardless of the location of the activity in relation to the Natura site), the relevant competent authority is required to execute the procedural requirements of the Habitats Regulations [See Appendix 10].

8.2 Competent authorities may not grant permission for plans or projects which could be damaging to any of the interests protected within a European site unless it can be shown, by means of an appropriate assessment, that the activity will not adversely affect the integrity of the site (in view of the site's conservation objectives, as published by Scottish Natural Heritage). Legislation requires that Scottish Natural Heritage be consulted for the purposes of the appropriate assessment. The Habitats Regulations also provide a derogation for exceptional circumstances where there is no alternative and there are imperative reasons of overriding public interest should it not be possible (following appropriate assessment) to ascertain that the proposal will not adversely affect a Natura site. If this derogation is applied, conservation measures to ensure that the overall coherence of Natura 2000 is protected must be implemented. The requirements of the Habitats Regulations are

summarised in SE Circular 6/1995 (as amended June 2000).The majority of Natura 2000 sites in Scotland are also Sites of Special Scientific Interest (SSSI).

9 Nature Conservation (Scotland) Act 2004

9.1 Protected Sites (SSSI): The Nature Conservation (Scotland) Act 2004 governs activities which might affect Sites of Special Scientific Interest (SSSIs). Any Scottish public body proposing to carry out an operation that may affect an SSSI must notify Scottish Natural Heritage before starting. If the public body thinks the operation may damage the protected natural features of the SSSI, they must apply to Scottish Natural Heritage for consent before starting.

9.2 Protected Sites (Ramsar): Ramsar sites are wetlands designated under the Ramsar Convention on Wetlands of International Importance, especially as waterfowl habitat. All Ramsar sites in Scotland are co-designated as Natura sites and/or Sites of Special Scientific Interest and are protected under the relevant statutory regimes associated with those designations.

10. Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (SI 1994/2716) – Part III

10.1 European Protected Species: Part III of the Habitats Regulations transposes the species protection requirements of the EC Habitats Directive (92/43/EEC). This is an entirely separate consideration to the requirements associated with Natura 2000 sites. If any action is proposed which may have an effect (either directly or on their habitat), on any European Protected Species (as listed on Schedule 2 of the Habitats Regulations), a licence must be obtained from the appropriate licensing authority. This may be either the Scottish Government or Scottish Natural Heritage depending on the action proposed.

11 The Wildlife & Countryside Act 1981 (as amended) (C69)

The Protection of Badgers Act 1992(C51)

11.1 Other Protected Species: A licence is required should operations to control *G. salaris* be likely to impact on any of the species specified in Schedule 5 to the Wildlife & Countryside Act 1981. In addition, it is an offence to take, damage, destroy or otherwise interfere with the nest of any wild bird while that nest is in use or being built, or take or destroy the eggs of a wild bird. Should operations to control *G. salaris* be likely to have any impact on nesting birds then a licence will be required and the Scottish Government must be contacted.

11.2 Badgers: The Badgers Act protects badgers and their setts. The Act makes it unlawful to wilfully kill, injure or take a badger, to cruelly ill-treat a badger, to use any of the specified methods for killing/taking a badger or to intentionally or recklessly interfere with a badger sett. A licence may be granted to permit otherwise unlawful acts under section 10(2) of the Act in certain circumstance such as for the purpose of preventing the spread of disease. Should operations to control *G. salaris* be likely to have an impact on badgers, a licence will be required and the Scottish Government must be contacted.

12. The Environmental Assessment (Scotland) Act 2005

12.1 The Environmental Assessment (Scotland) Act 2005, requires plans published after its implementation to be subjected to an environmental assessment.

Legislation relating to Water

13. Water (Scotland) Act 1980 (C45).

13.1 The Water (Scotland) Act 1980 places a duty on Scottish Water to supply wholesome water for domestic purposes to every part of its limit of supply and gives Scottish Water powers for the purpose of providing such a supply.

13.2 The 1980 Act also gives Scottish Water powers for the conservation and protection of water resources, which include the power to restrict use and the power to make Byelaws to prevent misuse and prevent pollution.

13.3 Byelaws for Preventing Pollution of Water (Catchment Control Byelaws): a number of Catchment Control Byelaws were made by the former Regional and Islands Councils for the purpose of protecting surface or ground waters against pollution. However, in accordance with the 1980 Act these Byelaws ceased to have effect ten years after they were made. Only the Byelaws for the Glasgow supply (Milngavie) have been extended as provided for in the 1980 Act and are still in force. Scottish Water has powers to make byelaws for the purpose of protecting its water resources from pollution.

13.4 The provisions of the Water (Scotland) Act 1980 that relate to the quality of private water supplies are enacted through the Private Water Supplies (Scotland) Regulations 2006 (SSI 2006/209). These regulations place local authorities under a duty to sample and monitor larger private supplies against an increasing suite of biological and chemical standards.

14. The Water Supply (Water Quality) (Scotland) Regulations 2001(SSI 2001/207)

14.1 The Water Supply (Water Quality) (Scotland) Regulations 2001 transpose the requirements of the European Drinking Water Directive and define wholesomeness by setting standards.

14.2 The 2001 Regulations require Scottish Water to monitor the quality of the water it supplies and to publish an annual report on the quality of that water.

15. The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2007 (SSI 2007/529)

15.1 This order should be consulted to determine whether there may be possible conflict between the use of water for drinking and the use of any proposed treatments.

Other Legislation.

16. Biocidal Products Directive 98/8/EEC (O.J. No.L123, 24.4.1998, p1-63)

16.1 The Biocidal Products Directive permits the authorisation and placing on the market of Biocidal products within the member state. It also provides for the recognition of authorisations within the Community. The Directive is transposed in the Biocidal Products Regulations 2001 (SI2001/880)

16.2 The Directive aims to establish, at Community level, a positive list of active substances that may be used in Biocidal products.

16.3 Only products that have been authorised may be used as Biocidal products. Authorisation for use of Rotenone as a Biocidal product is currently being sought from EU by Norway. If authority is granted it will apply to all member states. In meantime product can be used under National Rules.

Appendix 2 Roles and Responsibilities of Scottish Government Departments, External Enforcement Bodies and other Stakeholders.

A. **Scottish Government Groups**

Overall responsibility for preparing for and dealing with an outbreak of *Gyrodactylus salaris* in Scotland rests with Marine Scotland, Performance and Aquaculture Division. The Division's functions are described in Section 4 on page 14.

Relevant functions of other groups are described below.

1. **Communications Directorate**

1.1 The Communications Directorate will be responsible for dealing with all requests from the media for information and provision of staff for interviews. They will organise and chair media briefings as required. Consideration will be given to seeking assistance from the Resilience team.

1.2 The Director of Communications will deal with all aspects of media briefing related to the DSG and requests for interviews with Ministers. He/she will be a member of the DSG.

1.3 A Communications Officer will be attached to NDCC and will be responsible for dealing with local media requests. He/she will also liaise with Press Officers of other organisations at local level to ensure that a coordinated response is achieved.

1.4 All requests for interviews to individuals in the chain of command must be referred to the relevant Press Officer before any agreement can be given to undertake an interview. It is unlikely that any official out with the chain of command will give media interviews but each request will be judged on its merits.

2. **Human Resources Services**

2.1 Human Resources Services will be responsible for dealing with requests from DSG/ **Marine Scotland, Performance and Aquaculture Division** for additional staff to enable an effective response to an outbreak to be mounted.

2.2 They will be responsible for briefing DSG and NDCC Managers to ensure that staff rules in relation to employment law, payments, travel and subsistence entitlements etc are understood and followed.

2.3 In the event of a large outbreak, consideration will be given to posting a Human Resource manager to the NDCC.

3. **Finance Directorate**

3.1 Finance Directorate will be responsible for ensuring the payment, via Scottish Government Accounting System, of all invoices (including any agreed claims for compensation)received as a direct consequence of an outbreak of *G. salaris*. All such invoices must be duly processed and authorised by a senior manager from DSG, NDCC or Marine Scotland.

3.2 Finance Directorate will advise on the affordability of any measures proposed.

3.3 Finance Directorate will be responsible for meeting requests for the provision of formal budget cover and any required accounts codes.

3.4 Finance Directorate will consider proposed arrangements to secure the regularity, propriety and value for money of any proposed expenditure.

4. Scottish Government Procurement

4.1 Scottish Government Procurement will arrange framework agreements/call off contracts with Local Authorities, Enforcement Agencies and Private Contractors as applicable for the supply of goods and services. Ordering procedures must ensure that the ownership of these goods/services remains with the Scottish Government, irrespective of who places the order.

4.2 In addition they will procure accommodation, goods and services from other sources as requested by DSG and/or NDCC.

5. ISIS (Information Services and Information Systems)

5.1 ISIS will be responsible for the provision, installation, maintenance and support of any additional IT equipment required in the control of the outbreak.

5.2 The unit will also be responsible for developing new IT programmes if these are required.

5.3 The Network Services Division is responsible for provision of extra telephone facilities.

5.4 There may be constraints in more remote areas due to lack of infrastructure facilities.

6. Geographic Information Science and Analysis Team (GI-SAT)

6.1 GI-SAT will assist in outbreak control by providing facilities to plot actions and to provide information on individual catchments to permit detailed planning to either contain or eradicate the parasite.

7. Economic Impact Assessment Group

7.1 The Economic Impact Assessment Group will assess the effects of the disease outbreak on the salmon fisheries and ancillary industries.

7.2 The group will also assess the effects on any industrial or leisure pursuits involving affected waters. The Group will advise Ministers on the nature and scale of any adverse effects.

8. Natural Resources Division

8.1 Natural Resources Division leads on policy in relation to the EC Habitats and Birds Directives in the terrestrial environment. This includes policy in relation to Natura 2000 sites, SSSIs and protected species.

8.2 The Biodiversity Strategy Team leads on policy in relation to the Scottish Biodiversity Strategy, its Implementation Plans, the UK Biodiversity Action Plan, the Biodiversity Duty and Invasive Non-Native Species issues.

9. Drinking Water Quality Division

9.1 Drinking Water Quality Division are responsible for implementing elements of the Water (Scotland) Act 1980 and the Drinking Water Directives.

9.2 The Drinking Water Quality Regulator (DWQR) is responsible for enforcing the Water Supply (Water Quality) (Scotland) Regulations 2001. DWQR has powers to enforce action to ensure that public water supplies are safe for human consumption.

9.3 The Division / Regulator will need to be consulted when planning eradication programmes that are likely to involve any of the above legislation. This is especially important where such programmes could include the introduction of substances into watercourses upstream of drinking water abstraction points.

10. Marine Scotland Science.

10.1 MSS is part of Marine Scotland.

10.2 MSS will be responsible for serving and enforcing disease control notices, for taking samples, providing a diagnostic service and carrying out epidemiological investigations.

10.3 MSS will advise DSG on issues relating to containment and eradication.

10.4 MSS is responsible for producing and maintaining an Operations Manual the current version of which is at Appendix 11 (Page 123).

10.5 MSS maintain a comprehensive website. They will ensure that there are highly visible links to any official *G. salaris* website.

10.6 In cooperation with Scottish Government Communications Directorate, MSS will deal with local and national press enquiries in line with current policy.

10.7 MSS has an established GIS section which will prepare and supply mapping capability to MSS staff, the NDCC, LDCC (if implemented), DSG (if required) and other agencies if possible.

10.8 MSS will be responsible for the operation of the NDCC.

10.9 MSS will be responsible, through the NDCC, for the implementation and operation of any LDCC established during an outbreak of *G. salaris*.

10.10 MSS will be responsible for the training of staff seconded or volunteered to assist in the sampling and containment operations in relation to *G. salaris* outbreaks.

11. Animal Health and Welfare Division

11.1 The Scottish Government Animal Health and Welfare Division, Animal By-products Branch, is responsible for advising on the disposal of infected fish and fish waste.

11.2 They will advise the NDCC Manager on proposals to dispose of infected fish or fish waste.

11.3 The Veterinary Team is responsible for advising on fish welfare issues.

12. Rural Payments and Inspections Directorate

12.1 The Directorate's Agricultural Staff from local offices can assist in setting up and manning help lines and information services. Assistance may be sought from the Resilience team

12.2 Their local expertise may be used in drawing up proposals for eradication plans and for resolving local problems.

12.3 Local Area Offices may be able to supply administrative staff of grades A3 to B1 to form the nucleus of an administrative team to the NDCC Management.

13. Staff Welfare Officer

13.1 The Staff Welfare Officer is responsible for safeguarding the welfare of all Scottish Government staff whether they are working at their home unit or on secondment.

13.2 The work of eradicating disease can mean working longer hours than normal often in a stressful environment. The Staff Welfare Officer will be responsible, in conjunction with the NDCC Manager and DSG, for ensuring that staff welfare is protected.

13.3 The following services are available to help managers and staff:-

- The Counselling and Welfare Service provide a confidential service to managers and staff and can be contacted on 0131-244-2942.

- The Employee Assistance Programme is a confidential service, provided by Independent Counselling and Advisory Services Ltd (ICAS) and may provide a useful source of support to staff and their families. Their helpline number is 0800 587 5670.

14. **Departmental Health & Safety Officer (DHSO)**

14.1 DHSOs are responsible for ensuring that all staff and third party staff are provided with a safe working environment and that management put in place reasonable precautions to protect staff from undue hazards.

14.2 DHSOs will have to ensure that risk assessments are carried out, for all new procedures to be undertaken, and a written analysis is read and signed by all staff involved before any new work is carried out.

15. **Scottish Government Legal Directorate (SGLD)**

15.1 SGLD will have to be consulted when advice is required on legislative issues.

15.2 SGLD will provide advice and draft any new or amending legislation that may be required.

B. **External Enforcement and Advisory Bodies**

16. **Local Authorities**

16.1 Animal Health Inspectors employed by Local Authorities are responsible for ensuring that the safe disposal of dead fish and other infected materials is carried out by legal means from areas subject to control measures. If the owner of the Animal By Product fails to take action the Local Authority may carry out the work of disposal and retrieve the cost as a civil debt.

16.2 Local Authorities are able to supply a wide range of goods and services to deal with disease emergencies. They have "call-off" contracts with Defra for use in outbreaks of exotic animal diseases.

16.3 Local Authority Environmental Health Officers (EHOs) have statutory duties relating to the quality of private water supplies. They will need to be consulted in the event of proposals to treat waters from which private supplies are drawn.

17. **Police**

17.1 Police Forces in Scotland have no direct input into the control of *G.salaris* outbreaks but will provide assistance in gaining lawful access to premises when the owner refuses an Inspector legitimate access.

17.2 The Police must be used to stop/apprehend vehicles and drivers if illegal movements are suspected.

17.3 The Police will become involved if criminal activity is suspected e.g. persons deliberately spreading disease.

18. **Scottish Environment Protection Agency (SEPA) (http://www.sepa.org.uk)**

18.1 SEPA is responsible for enforcing environmental legislation and giving advice to Scottish Government on proposals to contain/eradicate *G. salaris.*

18.2 SEPA can provide detailed maps of catchment areas and, in many cases can provide hydrological data and basic chemical data for suspected or infected rivers.

18.3 SEPA will also, in conjunction with the Scottish Government's **Animal Health and Welfare Division's** Veterinary Team and the Local Authority, have responsibilities with respect to regulating the disposal of dead fish.

18.4 SEPA has a major role to play in developing eradication plans that involve the use of chemical treatment of catchments.

18.5 SEPA Officers may be able to assist in placing of Notices but this will depend on the availability of resources.

18.6 SEPA may be required to authorise, under CAR, any barriers that may be required in an eradication programme

19. **Scottish Natural Heritage (SNH) (http://www.snh.gov.uk)**

19.1 Scottish Natural Heritage is responsible for advising Scottish Ministers in matters relating to the conservation and enhancement of the natural heritage for promoting its sustainable use, and for fostering its understanding and enjoyment by the public.

19.2 Legislation requires that SNH be consulted for the purposes of any appropriate assessment undertaken by a competent authority for any plan or project which is likely to have a significant effect on a Natura 2000 site..

20**. Association of Salmon Fishery Boards (http://www.asfb.org.uk)**

20.1 The ASFB is the representative body of the 42 DSFBs (see section 21 below) which have statutory powers and duties to manage and conserve salmon and sea trout stocks. Not all parts of Scotland are currently covered by DSFBs e.g. Clyde, Loch Lomond and North Ayrshire/Renfrewshire. The ASFB itself has no statutory powers.

20.2 The ASFB will provide a co-ordinating role between all the DSFBs and works closely with Rivers and Fisheries Trusts of Scotland (RAFTS). It will be the principal conduit for communication with MSS and Marine Scotland's Performance and Aquaculture Division.

20.3 The ASFB will assist with publicising control measures.

20.4 The ASFB will assist in the development, promotion and implementation of appropriate training programmes for DSFB staff where required.

21. **District Salmon Fishery Boards (DSFBs) (http://www.asfb.org.uk)**

21.1 DSFBs are statutory bodies set up under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 [the 1986 Act was abolished, to the extent that it applied in Scotland (except for that part of the River Tweed catchment that lies within Scotland), by the 2003 Act]. The Scotland Act 1998 created a Commission not a Board to manage the activities on the Tweed.

21.2 The local DSFB (if relevant) will provide the Head of the NDCC with precise and up-to-date details of all known owners or managers of salmon fisheries in the affected water catchment(s).

21.3 DSFBs will provide information to MSS and Marine Scotland's Performance and Aquaculture Division on owners or occupiers of non-farmed waters and angling clubs etc.

21.4 DSFBs will report any suspicion of infection to MSS and remove dead and dying fish from non farm waters and ensure their safe disposal if so authorised by Ministers. They may also transfer such fish to MSS for diagnostic purposes if required.

21.5 DSFBs will assist with publicising control measures.

21.6 There are no DSFBs in a number of catchment areas. Statutory authority for these areas lies with the Scottish Government's Marine Scotland Fisheries Division.

21.7 DSFBs may have trained personnel who could assist Marine Scotland & MSS in outbreak control. Similar help may be provided by the Tweed Commission for activities on the Tweed

22. **Water Bailiffs and Water Wardens**

22.1 Water Bailiffs are appointed by DSFBs to enforce the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. In areas where there are no DSFBs, Scottish Ministers appoint water bailiffs. Water Wardens are appointed by Scottish Ministers to secure compliance with protection orders made under Part 4 of the 2003 Act.

22.2 Water Bailiffs have wide ranging powers to enter premises, make enquiries and seize fish and equipment if they have reasonable grounds for believing that an offence has been committed. Water Wardens have less extensive powers than water bailiffs. There were powers in the Diseases of Fish Act 1937 to permit bailiffs to enter premises and take samples under the Act. This Act has been repealed but Scottish Ministers can authorise persons to be inspectors for the purposes of the Aquatic Animal Health (Scotland) Regulations 2009 so any bailiffs so authorised could assist MSS in field work related to an outbreak.

23. **Scottish Water (http://www.scottishwater.co.uk)**

23.1 Scottish Water is responsible for managing Scotland's freshwater assets and providing clean potable water for domestic and industrial use. They will give advice on control measures that may involve diversion of water supplies, treatment with chemicals and the destruction and removal of fish.

23.2 Scottish Water will have to be consulted in the event of proposals to use chemical treatments, to place barriers in catchments and/or to cut off public supplies.

24 Food Standards Agency (http://www.food.gov.uk/scotland)

24.1 Food Standards Agency is responsible for ensuring that food safety is not detrimentally impacted by treatments for *G. salaris*, and will undertake risk assessments on the impact of treatment.

Enforcement of any food safety measures necessary will be undertaken by Local Authority Enforcement Officers.

24.2 Food Standards Agency will also provide advice to the public in relation to the consumption of fish and shellfish from treated waters

C. Other Groups

25. National & Local Stakeholder Groups

25.1 Stakeholder Groups will be set up at national and local level to consult with and advise the DSG and NDCC on control and eradication issues that affect their industry/pursuit and/or members.

25.2 The National Stakeholder Group will be set up by the Head of DSG, and will liaise directly with him/her. The group will be responsible for disseminating information to relevant groups about the diseases status. They will also keep the Scottish Government informed of any issues within the control strategy that are likely to cause problems throughout Scotland or large areas thereof and help to seek solutions.

25.3 Local Stakeholder Groups will be set up by the Head of the NDCC and be responsible for disseminating local information to their members/ contacts. They will keep the Head of NDCC informed of local problems and help to seek solutions.

26. Fish Veterinary Society (http://www.fishvetsociety.org.uk)

26.1 Fish Vets have a role to play in carrying out surveillance work, in treatment of fish diseases and in supervising welfare at emergency slaughter.

26.2 Fish Vets can advise on and supervise the treatment of fish farm stocks in order to reduce losses whilst decisions are being made and plans put in place to carry out an eradication campaign.

26.3 Specific Fish Vets may be a source of expertise to assist MSS in control of an outbreak.

27. Rivers and Fisheries Trusts Scotland (RAFTS) (http://www.rafts.org.uk)

27.1 RAFTS are the representative body for all the Rivers and Fisheries Trusts. They are a charitable body and have a role in dissemination of information to members.

27.2 Trusts are charitable bodies which routinely monitor freshwater fish stocks and habitat, and undertake restoration, environmental and education projects.

27.3 They can provide information, education and communication services, and have in the region of 50 fisheries biologists and seasonal staff working at a local level across Scotland. The biologists may be able to assist MSS in field work associated with an outbreak. The only significant areas where Trusts exist without DSFBs are in Loch Lomond and the Clyde catchment.

28. **Scottish Salmon Producers' Organisation (SSPO) (http://www.scottishsalmon.co.uk)**

28.1 SSPO is a Producers' Organization established under EU legislation. Its membership accounts for some 95% of the farmed salmon produced in Scotland.

28.2 SSPO will need to be consulted when any action is likely to have effects on Scottish salmon farms or salmon farming businesses.

29. **British Trout Association (BTA) (http://www.britishtrout.co.uk)**

29.1 BTA represents about 80% of the farmers involved in trout production in the UK.

29.2 BTA will need to be consulted if any action is likely to have adverse effects on trout farms.

30**. Scottish Anglers' National Association (SANA) (http://www.sana.org.uk)**

30.1 The Scottish Anglers National Association Ltd., which represents 250 Clubs and around 30,000 anglers, is recognised as the governing body for Game Angling in Scotland.

30.2 SANA Ltd., which is a Company Limited by Guarantee, consists of eight committees, which together with a Company Secretary Directors, Vice President and President voluntarily represents the membership.

30.3 SANA is responsible for environmental issues, licensed coaching, club development as well as selection and management of International Fly Fishing Teams, and controls and delivers the Scottish National Trout Fly Fishing Championship and Scottish National Stillwater Championship and the Open Pairs and singles competition.

30.4 SANA provides a channel of communication for the game angling sector.

31. **Scottish Federation for Coarse Angling (http://www.sfca.co.uk)**

31.1 SFCA will be consulted over the impact on coarse fisheries in affected catchments of any potential containment or eradication measures under consideration.

31.2 SFCA provide a channel of communication with the coarse angling sector; both in terms of disseminating information from the Scottish Government to anglers, and by way of passing "up the line" any reports of apparent infection observed by anglers on the bank.

32. Atlantic Salmon Trust (http://www.atlanticsalmontrust.org)

32.1 The Atlantic Salmon Trust is a UK wide charity which draws its funding largely from private donations.

32.2 The Trust's main function is to work for the conservation and improvement of wild salmon and sea trout stocks to a level that allows sustainable exploitation. To this end the trust conducts and supports research activities and gives practical advice on the management of fisheries and rivers.

33. Salmon and Trout Association (http://www.salmon-trout.org)

33.1 The Salmon & Trout Association is a charity registered in Scotland, Wales and England, whose objectives are:

- To promote for the public benefit the conservation, protection and sustainable exploitation of salmon, trout and other fish stocks of United Kingdom origin, and the conservation and improvement of the aquatic environment and ecosystems necessary for them to thrive.

- The advancement of public education relating to the conservation of the aquatic environment and the interaction between human beings, the environment and fish, whether through angling or otherwise;

- To promote for the public benefit, training in water safety, knowledge of the aquatic environment and identification of and respect for its dependent species, including fish, whether through angling or otherwise;

- To promote research and to publish the useful results thereof in respect of the factors affecting the natural and artificial regeneration of salmon, trout and other fisheries in the United Kingdom including the general ecology of river catchments and the marine environment and the effect of commercial, industrial and land management practices on aquatic ecosystems.

33.2 The Association in Scotland has numerous individual, trade and professional members and would make this channel available and use it for the communication of information and directives relevant to *Gyrodactylus salaris* to its membership.

34. Scottish Fisheries Co-ordination Centre (http://www.scotland.gov.uk/topics/marine/science/sfcc)

34.1 The Scottish Fisheries Co-ordination Centre (SFCC) is an association of District Salmon Fishery Boards, Fisheries Trusts, MSS, the Scottish Government and others established in 1997 in order to help its members collect, collate, use, and provide information on freshwater fish, their habitats and fisheries.

34.2 The SFCC provides a mechanism for local fisheries managers and biologists to standardise aspects of data collection, co-ordinates the supply of spatially related GIS data, provides a mechanism for scientific analysis of fish and habitat data and collates and provides fish and fisheries data at local, regional and national scales to inform policy decisions. Additionally, the SFCC co-ordinates training courses of relevance to this work, and facilitates discussion and collaboration among local fisheries managers and biologists

35. **Ordnance Survey (http://www.ordnancesurvey.co.uk)**

35.1 The Ordnance Survey is the primary source of paper and digital mapping which would be needed for planning and implementing disease control measures.

35.2 They can also provide a Geographical Information System (GIS) to enable plotting of data in relation to river systems.

35.3 In the event of large outbreaks Ordnance Survey may be able to provide staff to operate GIS systems.

36. **Hydro Electricity Industry**

36.1 The hydro-electric industry uses large quantities of loch and river water to generate electric power. Part of the process involves transfer of water within and between catchments.

36.2 Hydro-electric industry controls about 35 fish passes that may need to be closed to prevent upstream migration of fish.

36.3 In an eradication programme, formal consultation will be required in advance of any actions to clean out water intakes or to prevent water transfer as a disease control measure.

37. **Scotch Whisky Association (http://www.scotch-whisky.org.uk)**

37.1 The Scotch Whisky industry relies on the supply of good quality water, both for direct use in the production process and, representing the majority of water use, for cooling purposes.

37.2 Given the production, competition and reputational considerations, it will be important to work closely with impacted distilleries and the Scotch Whisky Association on operational and communication planning, as well as implementation.

38. **Sportscotland (http://www.sportscotland.org.uk)**

38.1 Sportscotland is the national agency for sport. They have a role in representing the interests of sport and physical recreation on the group and have done so in drawing up this plan.

38.2 Sportscotland can advise on relevant sport interests to be involved in the process and can engage with sport interests in implementing this plan.

39. **Scottish Canoe Association (http://canoescotland .org)**

39.1 The SCA will be consulted over the impact on canoeing in affected catchments.

39.2 The SCA will provide a channel of communication with canoeists and convey information relating to access to inland waters within an infected catchment and any requirements to disinfect recreational equipment.

40. **Scottish Society for the Prevention of Cruelty to Animals (Scottish SPCA) (http://www.scottishspca.org)**

40.1 Scottish SPCA is a charitable body with no legal powers in relation to the welfare of animals. They do, however, respond to complaints from the public over cruelty and work closely with Procurators Fiscal in taking cases to court.

40.2 Scottish SPCA may request permission to audit slaughter procedures in the event of an outbreak and NDCC managers, in consultation with DSG, should be prepared to grant the request subject to any conditions which may be appropriate to prevent disease spread.

41. **VisitScotland (http://www.visitscotland.com)**

41.1 VisitScotland is the national tourism agency for Scotland, whose core objectives are to:-

- Attract visitors by building a successful Scottish tourism brand
- Engage and work in partnership with the tourism industry
- Enhance the visitor's experience
- Provide strategic direction to the industry
- Manage its business efficiently and effectively

41.2 VisitScotland is aware that an outbreak of *Gyrodactylus salaris (Gs)* would have a significant impact on angling tourism and water sports and is committed to promoting awareness of *Gs* through websites, tourist information centres, anglers welcome scheme and quality assurance advisers.

41.3 VisitScotland wholeheartedly supports the Scottish Government's communications and contingency planning to keep the disease out of Scotland.

Appendix 3 Factors to be considered when deciding on whether to contain or eradicate disease.

In the initial stages of an outbreak, movement controls may be imposed nationwide until the distribution of the parasite is established. Thereafter consideration will be given to either containment and/or eradication on a catchment by catchment basis. Eradication will be the best solution if it is practical but all factors covering severity and distribution of the disease will need to be taken into account. (see bullets 4 & 5 in the assumptions on which this plan is based.)

1. **Containment**

1.1 The suspicion or confirmation of the presence of *G. salaris* will immediately lead to the introduction of appropriate containment measures in the infected area. In addition, if it is concluded that eradication is impossible or unacceptable, or that the salmon population in a catchment can be sacrificed to the risk from *G. salaris*, containment of the infection may be used as a long-term strategy.

1.2 Containment measures have been shown to have a significant level of success in preventing the progressive spread of *G. salaris* from infected catchments in both Norway and Finland. The Expert Group will obtain a comprehensive and up-to-date knowledge of the approaches and success levels of the policy in these countries.

1.3 Regular surveillance for *G. salaris* infection in the buffer zone established around the infected zone will permit the assessment and, therefore, the active management of the risk of spread of the infection from the delineated source. The frequency of the surveillance and sampling will initially be high after the first detection of *G. salaris* infection but will later be adjusted depending on the results obtained and advice from the Expert Group. The level of surveillance carried out by water bailiffs will be increased in initial stages.

1.4 The movement of live fish of susceptible species poses the greatest risk of transferring *G. salaris* from infected to uninfected areas. The rigorous application of the powers given in the Aquatic Animal Health (Scotland) Regulations 2009 may be used to restrict the activities of man in transferring infection from controlled areas. Where recent movements from a site or area known or suspected of being infected have occurred consideration will be given to depopulating the receiving farm to limit the spread of the parasite.

1.5 Treatments and the prevention of escapes of fish from infected fish farms to uninfected local waters will be an immediate priority. If prevention of escapes is difficult, it may be necessary to depopulate an infected fish farm to stop disease spread even if eradication is not an option for the whole catchment. However, when infection is present in wild populations, the natural movements of infected wild fish through freshwater may lead to the infection of the whole catchment unless barriers impassable to fish are constructed and maintained to prevent the movement of fish from the infected area. It is likely that such a measure would only be practical in very exceptional circumstances but could be appropriate as a temporary measure prior to the implementation of an eradication strategy. Where fish passes exist in infected catchments they should be closed immediately following confirmation of the presence of the parasite in an attempt to contain the disease.

1.6 *G. salaris* is known to have the ability to survive in freshwater for a limited period free from fish hosts. *G. salaris* uses a variety of potential and transport hosts. Knowledge of the various inter reactions is not fully understood. The current information is summarised in Annex 1 on P 53. *G. salaris* has the potential for limited spread through freshwater. The treatment of effluent waters from infected fish farms (e.g. chemical, heat, salinity) may prevent spread to wild fish populations, if initiated early. The prevention of such spread in natural conditions may be considered to be virtually impossible.

1.7 Measures to contain risk associated with the use of angling equipment in infected areas are outlined in the pamphlet "Keep *Gyrodactylus salaris* out of Scottish Rivers" and the Code of Practice to Avoid the Introduction of *Gyrodactylus salaris* to GB. A "Home & Dry" campaign was launched in 2007 aimed at anglers and other leisure users of water who take their equipment abroad. Leaflets provide advice on drying and/or disinfecting equipment before it is re-used in Scottish waters(http://www.scotland.gov.uk/Topics/marine/Fish-Shellfish). This information, applicable also to boating, sailing and fish farm equipment, will be widely disseminated to local residents. More widespread targeting of specialist audiences e.g. wild fishery interests, fish farmers, anglers and other users of water will be achieved by distribution of the same information to groups listed in Appendix 2. There is also a CD ROM.

1.8 The safe disposal of dead fish and processing waste is the responsibility of the fishery owner or fish farmer or fish processor regulated by SEPA and the relevant Local Authority, depending on the waters from which they came and the method of disposal. The Animal By-Products (Scotland) Regulations 2003 sets out the permissible ways of dealing with various categories of animal waste. Fish infected with *G. salaris* and processing waste of these fish would be classed as Category 2 animal by-products This means there are three principal options available for dealing with the waste resulting from an outbreak of *G. salaris* namely rendering, incineration – either on site or remotely - or in certain specific cases by burial. Responsibility for high risk waste lies with any person who has it in their possession or under their control. The Animal Health Inspector of the relevant Local Authority has enforcement responsibility for ensuring the safe disposal of high risk infectious material preferably by rendering or incineration

1.9 Incineration may be undertaken on farm if a suitably approved facility already exists there. Rendering is cheaper and able to handle much larger quantities of waste than incineration. These two methods are also administratively simpler because the facilities have already been assessed and approved to handle category 2 animal by-products. The route of disposal will be subject to supervision by Animal Health, MSS and/or Local Authority Inspectors.

1.10 Burning and burial are permitted in certain circumstances, usually only in designated remote areas but may also be considered where there is a health risk associated with moving the waste, or a lack of suitable disposal capacity. In order to bury or burn *G. salaris* infected waste, SEPA would need to be content that the waste would not pose an unacceptable risk to the environment.

1.11 Local Consultants in Public Health Medicine {Health Board Employees} may need to be consulted if run off, leachates or smoke from the disposal process, are thought to pose risk to Public Health.

2. **Eradication**

2.1 Eradication of *G. salaris* infection has been successfully achieved in several rivers and fish farms in Norway. The Expert Group should obtain comprehensive and up-to-date knowledge of the approaches and success levels of the policy in that country and others with a view to guiding policy if better methods become available.

2.2 Eradication of the infection may be the preferred option if the distribution of infection is restricted, limited to a small watercourse or confined to a fish farm. All the measures required for a containment programme will also be implemented during the planning stages to an eradication programme to reduce the risk of disease spread both within the catchment and to other catchments.

2.3 It may be necessary to construct barriers to prevent the migration of susceptible species of fish into treated or untreated parts of the catchment over a longer period. Barriers may also be used to divide a catchment up into manageable sections for treatment. On fish farms it will be necessary to ensure against escapes until all fish are killed out.

2.4 Given the nature of the possible chemical treatments to control the infection or to remove susceptible fish, the possibility of treatment would have to be discussed with SEPA and SNH. Legal advice from SGLD would need to be sought in event of SEPA and/or SNH refusing to grant the necessary consents. Ministers have powers to instruct agencies to issue the necessary consents.

2.5 Gyrodactylosis can be effectively managed as a disease in fish farms through the use of chemical (formalin) baths for fish stocks. Current information on treatments for *G. salaris* is contained in Annex 2 (page 56). However, the infection may not be eliminated by such methods and fallowing of the farm will be required to allow eradication of the parasite. Fallowing may be enforced under the terms of any movement restrictions in place on the farm. Such measures will only be appropriate for removing *G. salaris* from an area, if there is evidence that the infection has not spread from the farm to local wild populations of susceptible fish species. When it is evident that the on-farm precautions are inadequate to prevent escapes consideration will be given to destroying the farm stocks to prevent disease spread to the wider environment.

2.6 Practical experience in Norway has shown that eradication of infection may be possible through the use of rotenone when *G. salaris* occurs. The Expert Group will develop and maintain an up-to-date protocol dealing with the planning and implementation of an eradication scheme for *G. salaris.* The protocol will be based on the use of rotenone and any other suitable chemical which may be identified. The protocol will include estimated costs per cubic flow and length of river, other resources required (e.g. identified materials and staffing) and the ecological and social implications of treating the main types of river systems present in Scotland. Appendices 8 & 12 contain details of rotenone and aluminium sulphate treatments.

2.7 It is possible to eliminate *G. salaris* from some watercourses through the use of barriers that are impassable to migratory fish if these are placed in the estuary at salinity levels where the parasite cannot survive and no fish populations that are capable of sustaining the parasite remain above the barrier. The integrity of such barriers would need to be securely

maintained for the complete period while susceptible fish species are able to persist in the catchment. The Expert Group will maintain an up-to-date broad evaluation of the practicality and costs of such barriers for the main appropriate types of watercourses present in Scotland and make this available to the DSG in the event of an outbreak of *G. salaris*.

2.8 It is important that any plan to eradicate susceptible species of fish should include measures to mitigate against the significant loss of fish populations in the target watercourse. These measures would include the preservation of stocks and genetic material in gene banks and the timing of any treatment to coincide with the season when the majority of adult fish stocks are at sea where this is applicable. Consideration could also be given to timing treatments when least damage would be done to the operation of distilleries, hydro-electric plants and water transfer activities.

2.9 In making recommendations to Ministers on the feasibility of attempting to eradicate disease, DSG will take note of consultations with the internal and external stakeholder groups listed in Appendix 2, the Expert Group and disease and epidemiology reports prepared by MSS. Criteria to be evaluated will include the level of disease, the practical difficulties in eradication, the cost, the consequences of taking no action, any adverse effects on the environment and any adverse economic effects on the angling and associated industries.

2.10 Experience in Norway suggests that it is possible, in some circumstances, to eliminate or reduce the disease burden by treating early especially if disease is found in tributaries with little human activity to complicate the picture.

3. **Other Considerations**

3.1 This plan is aimed at the containment and/or eradication of *G. salaris* should Scottish waters become infected. There are, however, many users of water on whom this plan will impact should it ever have to be implemented. This section of the plan deals with arrangements to deal with these impacts when planning containment/eradication plans. They are not meant to be all embracing and, if an outbreak occurs, there may be other new factors that will have to be taken into account. It will be up to Scottish Government staff and stakeholders to identify and deal with any new or emerging factors.

3.2 Rotenone is the only chemical that has been successfully used on a large scale to treat infestations of *G. salaris.* It is selective in its action, dependant upon the concentration at which it is applied and kills the host (denying the parasite the means to survive), all other fish species and may also kill other vertebrate and invertebrate species. Some of these species will be of interest and value from a conservation point of view and may merit specific special attention. Aluminium sulphate has also been used, in field trials and as part of the Norwegian eradication programme, to kill the parasite but does not kill the host or other species. The use of aluminium sulphate may markedly alter the water chemistry and thus impact on species by this route. SEPA and SNH must be consulted in the event of proposals to use either chemical.

3.3 SEPA is responsible for enforcing environmental legislation and may require to authorise the use of chemicals to destroy *G. salaris.* SEPA will need to be consulted when eradication plans involve the use of either rotenone or aluminium sulphate. SEPA will also need to be consulted when there are proposals to contain the spread of disease within a fish farm by the use of chemicals such as formalin as discharge consents may be required. A list of chemicals which may be used to treat fish against *G. salaris* is in Annex 2 (page 56).

3.4 Rotenone is moderately toxic to humans at high dose rates and formalin based products can be extremely irritant. Aluminium sulphate is highly acidic and may be toxic in some circumstances. Bearing in mind the major use of water in food preparation and for drinking, medical colleagues should be consulted on any plans to use these chemicals. Local Authority Environmental Health Officers have responsibility for private water supplies and the Drinking Water Quality Regulator for water quality issues. They will both need to be consulted.

3.5 If burial and/or local incineration is required to dispose of dead fish, problems may arise in terms of human health, from leachates and/or products of incineration given off as aerosols/smoke. Medical colleagues and Consultants in Public Health Medicine from the appropriate Health Board(s) should be consulted when plans involve either of these disposal methods.

3.6 The hydro electric and water supply industries regularly practice water transfers both within and between catchments to ensure adequate supplies. In the planning of containment and eradication measures these industries will need to be consulted. Actions that may be required include the cessation of water transfers to limit disease spread or the extension of the infected and buffer zones to include all the area(s) involved in any transfer operations and the temporary closure of a power station to allow chemical treatment therein.

3.7 The whisky industry uses large quantities of water primarily for cooling purposes. Plans to treat water will have to be discussed with individual distilleries to ensure that adequate alternative water supplies can be obtained for the duration of treatment.

3.8 A large variety of leisure pursuits use water for their activities. Where it has been assessed that leisure pursuits pose a potential risk of the spread of *G. salaris*, these activities must be controlled or measures taken to ensure that the identified risk is mitigated against. This should be done in full consultation with the relevant representative body.

ANNEX 1. POTENTIAL HOSTS AND TRANSPORT HOSTS FOR *G. SALARIS*.

Species	Attach			Reproduce			References
	Lab	Field	Farm	Lab	Field	Farm	
Atlantic salmon, *Salmo salar*	✓	✓	✓	✓	✓	✓	
Rainbow trout, *O. mykiss*	✓	✓	✓	✓		✓	Mo, T. A. (1988) Virksomheten i 1987 og program for virksomheten i 1988. *Gyrodactylus* undersøkelsene ved Zoologisk Museum, Universitet Oslo. Rapport nr. 4, pp.1-29. Bakke, T.A., Jansen, P.A., Kennedy, C.R. (1991) The host specificity of *Gyrodactylus salaris* Malmberg (Platyhelminthes, Monogenea): Susceptibility of *Oncorhychus mykiss* (Walbaum) under experimental conditions. *Journal of Fish Biology* **39:** 45-57. Buchmann, K., Uldal, A. (1997) *Gyrodactylus derjavini* infections in four salmonids: comparative host susceptibility and site selection of parasites. *Diseases of Aquatic Organisms* **28:** 201-209.
Brown trout, *S. trutta*	✓	✓		✓			Johnsen, B.O., Jensen, A.J. (1992) Infection of Atlantic salmon, *Salmo salar* L., by *Gyrodactylus salaris*, Malmberg 1957, in the River Lakselva, Misvaer in Northern Norway. *Journal of Fish Biology* 40: 433-444. Malmberg, G., Malmberg, M. (1991) Investigations on *Gyrodactylus* on salmonids in nature and in hatcheries in 1951-72 and 1986-May 1991. *Information från Sötvattenslaboratoriet, Drottningholm.* 2: 1-130. Jansen, P.A., Bakke, T.A. (1995) Susceptibility of brown trout to *Gyrodactylus salaris* (Monogenea) under experimental conditions. *Journal of Fish Biology* 46: 415-422.
Sea Trout *S. trutta trutta*			✓				Rokicka, M., Lumme, J., Ziêtara, M.S. Identification of *Gyrodactylus* ectoparasites in Polish salmonid farms by PCR-RFLP of the nuclear ITS segment of ribosomal DNA (Monogenea, Gyrodactylidae) Acta Parasitologica, 2007, 52(3), 185–195.

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Arctic charr, *Salvelinus alpinus*	✓	✓		✓	✓		Bakke, T.A., Jansen, P.A. (1991) Susceptibility of Arctic charr (*Salvelinus alpinus*) to *Gyrodactylus salaris* Malmberg (Monogenea). *Bulletin of the Scandinavian Society of Parasitology* **1:** 60. Bakke, T.A., Jansen, P.A., Harris, P.D. (1996) Differences in susceptibility of anadromous and resident stocks of Arctic charrr to infections of *Gyrodactylus salaris* under experimental conditions. *Journal of Fish Biology* 49: 341-351. Mo, T. A. (1988) *Gyrodactylus*-undersøkelsene av fisk I forbindelse med rotenonbehandligen av Skibotnelva I August 1988. University of Oslo, Zoological Museum, Gyrodactylusundersøkelsene. Rapport nr. 5, pp. 1-14. Robertson, G., Hansen, H. , Bachmann, L. , Bakke, T. A. , (2007) Arctic charr (*Salvelinus alpinus*) is a suitable host for *Gyrodactylus salaris* (Monogenea Gyrodactylidae) in Norway. Parasitology 134(2): 257-267. Olstad, K., Robertsen, G., Bachmann, L., Bakke, T.A., (2007). Variation in host preference within *Gyrodactylus salaris* (Monogenea): an experimental approach. Parasitology 134, 589–597
Brook trout, *S. fontinalis*	✓	✓					Bakke, T. A., Harris, P. D., Jansen, P. A. (1992) The susceptibility of *Salvelinus fontinalis* (Mitchell) to *Gyrodactylus salaris* Malmberg (Platyhelminthes; Monogenea) under experimental conditions. *Journal of Fish Biology* 41: 499-507.
Lake trout, *S. namaycush*							Bakke, T. A., Jansen, P. A., Grande, M. (1992) The susceptibility of *Salvelinus n* *Gyrodactylus salaris* Malmberg (Platyhelminthes; Monogenea) under experimen *(Serie A)*
Grayling, *Thymallus thymallus*	✓			✓			Bakke, T.A., Jansen, P.A. (1991) Susceptibility of Grayling (*Thymallus thymallus*) to *Gyrodactylus salaris* Malmberg (Monogenea). *Bulletin of the Scandinavian Society of Parasitology* 1: 61. Soleng, A., Bakke, T.A. (2001) The susceptibility of grayling (*Thymallus thymallus*) to experimental infections with the monogenean *Gyrodactylus salaris*. *International Journal for Parasitology* **31:** 793-797. Sterud, E., Mo, T.A., Collins, C.M., Cunningham, C.O. (2002) The use of host specificity, pathogenicity, and molecular markers to differentiate between *Gyrodactylus salaris* Malmberg, 1957 and *G. thymalli* Zitnan, 1960 (Monogenea: Gyrodactylidae). *Parasitology* **124:** 203-214.
Whitefish, *Coregonus lavaretus*	✓						Soleng, A., Bakke, T.A. (2001) The susceptibility of whitefish (*Coregonus lavaretus* L.) to experimental infections with the monogenean *Gyrodactylus salaris* Malmberg, 1957. *Bulletin of the Scandinavian Society for Parasitology* **11:** 32-36.
Salmothymus obtusirostris				✓			Zitnan, R. & Cankovic, M. (1970) Comparison of the epizootological importance of the parasites of *Salmo gairdneri irideus* in the two coastal areas of Bosnia and Herzegovina. *Helminthologia* 11:161-166.
Eel, *Anguilla anguilla*	✓						Bakke, T.A., A., J.P., Hansen, L.P. (1991) Experimental transmission of *Gyrodactylus salaris* Malmberg, 1957 (Platyhelminthes, Monogenea) from the Atlantic salmon (*Salmo salar*) to the European eel (*Anguilla anguilla*).

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							Canadian Journal of Zoology **69:** 733-737.
Lamprey, *Lampetra planeri*	✓						Bakke, T. A., Jansen, P. A., Brabrand, Å. (1990) Susceptibility and resistance of brook lamprey, *Lampetra planeri* (Bloch), roach *Rutilus rutilus* (L.) and perch, *Perca fluviatilis* L., to *Gyrodactylus salaris* Malmberg (Monogenea). *Fauna norv. (Serie A)* 11: 23-26.
Roach, *Rutilus rutilus*	✓						Bakke, T. A., Jansen, P. A., Brabrand, Å. (1990) Susceptibility and resistance of brook lamprey, *Lampetra planeri* (Bloch), roach *Rutilus rutilus* (L.) and perch, *Perca fluviatilis* L., to *Gyrodactylus salaris* Malmberg (Monogenea). *Fauna norv. (Serie A)* 11: 23-26.
Minnow, Phoniness phoniness	✓			X			Bakke, T. A., Sharp, L. A. (1990) Susceptibility and resistance of minnows, *Phoxinus phoxinus* (L.) to *Gyrodactylus salaris* Malmberg, 1957 (Monogenea) under laboratory conditions. *Fauna norv. (Serie A)* 11: 51-55
Perch, *Perca fluviatilis*	✓						Bakke, T. A., Jansen, P. A., Brabrand, Å. (1990) Susceptibility and resistance of brook lamprey, *Lampetra planeri* (Bloch), roach *Rutilus rutilus* (L.) and perch, *Perca fluviatilis* L., to *Gyrodactylus salaris* Malmberg (Monogenea). *Fauna norv. (Serie A)* 11: 23-26.
Three-spined stickleback, *Gasterosteus aculeatus*	✓						Soleng, A., Bakke, T.A. (1998) The susceptibility of three-spined stickleback (*Gasterosteus aculeatus*), nine-spined stickleback (*Pungitius pungitius*) and flounder (*Platichthys flesus*) to experimental infections with the monogenean *Gyrodactylus salaris*. *Folia Parasitologia* 45: 270-274.
Nine-spined stickleback, *Pungitius pungitius*	✓						Soleng, A., Bakke, T.A. (1998) The susceptibility of three-spined stickleback (*Gasterosteus aculeatus*), nine-spined stickleback (*Pungitius pungitius*) and flounder (*Platichthys flesus*) to experimental infections with the monogenean *Gyrodactylus salaris*. *Folia Parasitologia* 45: 270-274.
Flounder, *Platichthys flesus*	✓	✓					Soleng, A., Bakke, T.A. (1998) The susceptibility of three-spined stickleback (*Gasterosteus aculeatus*), nine-spined stickleback (*Pungitius pungitius*) and flounder (*Platichthys flesus*) to experimental infections with the monogenean *Gyrodactylus salaris*. *Folia Parasitologia* 45: 270-274. Mo T.A. 1987: Taxonomiske og biologiske undersøkelser. Virksomheten i 1986 og forslag til virksomheten i 1987. Gyrodactylusundersøkelsene ved Zoologisk Museum, Universitetet i Oslo. Rapport nr. 2, 70 pp.

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ANNEX 2. PUBLISHED INFORMATION ON TREATMENTS FOR *G. SALARIS*.

Buchmann, K. (1997) Salinity tolerance of *Gyrodactylus derjavini* from rainbow trout *Oncorhynchus mykiss*. Bulletin of the European Association of Fish Pathologists 17**:** 123-125.	Parasite eliminated at salinity greater than 7ppt.
Buchmann, K. Kristensson, R. T. (2003) Efficacy of sodium percarbonate and formaldehyde bath treatments against *Gyrodactylus derjavini* infestations of rainbow trout. North American Journal of Aquaculture 65**:** 25-27.	*G. derjavini* eliminated after 18h in sodium percarbonate at 80mg/L or more or formaldehyde at 20mg/L eliminated parasites. Significant reduction after formaldehyde at 5 pr 10 mg/L for 18h.
Crigel, P., Losson, B. & Defour, J. (1995) Utilisation de la quinaldine, un anesthetique pour poissons, a des fins antiparasitaires. Annales de Medecine Veterinaire 139**:** 343-348.	Quinaldine appears effective after 99secs at 26mg/l, but my translation of the original French article is not perfect. No identification of species and possibly a combination of *Dactylogyrus* and *Gyrodactylus* on the fish used.
El-Khatib, N.R.H. (2003) Biological eradication of some parasitic diseases in fishes using *Bacillus thurigiensis* Agerin® product. Veterinary Medical Journal Giza. 51(1), 19-28.	Not effective against *Gyrodactylus* spp. on *Oreochromis niloticus* at 1000ppm/1h or 2h, 500ppm/1h or 2h, 100ppm/indefinite
Mo, T. A. (2000) Desinfeksjon av fiskeutstyr. Fiske (Norwegian Angling Magazine) 3.	Use of Virkon to treat equipment. Personal communication from author indicates that Virkon kills *G. salaris* in a few seconds.
Moen A et al (2005)	Bekjempelsen av *Gyrodactylus salaris* i Ranaregionen 2003 - 2004. 230 p.
Poleo, A.B.S., Schjolden, J., Hansens, H., Bakke, T.A., Mo, T.A. (2004) The effect of various metals on *Gyrodactylus salaris* (Platyhelminthes, Monogenea) infections in Atlantic salmon (*Salmo salar*). Parasitology 128: 1-9.	Infected salmon were exposed to aqueous aluminium (Al), copper (Cu), zinc (Zn), iron (Fe) and manganese (Mn), at 4 different concentrations. There was a negative correlation between *G. salaris* infections and metal concentrations in both Zn- and Al-exposed salmon. In the Zn-experiment, all 4 concentrations tested (63-488 μg/L) caused a decrease in the *G. salaris* infections, while in the Al-experiment the *G. salaris* infection did not decline at the lowest concentration 292μg/L. The number of *G. salaris* increased continuously during the experiments in all control groups, and in all groups exposed to Cu, Fe and Mn. At the highest concentration (85μg/L), however, copper seemed to impair the growth *of G. salaris* infection. Aqueous Al and Zn have a stronger effect on the parasite than on the salmonid host.
Rach, J. J., Gaikowski, M. P. & Ramsay, R. T. (2000) Efficacy of hydrogen peroxide to control parasitic infestations on hatchery-reared fish. Health 12**:** 267-273.	Claim elimination possible, but only skin scrapes used to monitor fish, not whole fish examination.
Santamarina, M. T., Tojo, J., Ubeira, F. M., Qiunte	Bithionol and nitroscanate 100% effective

(1991) Anthelminthic treatment against *Gyrodactylus* sp. infecting Rainbow trout (*Oncorhynchus mykiss*). Diseases of Aquatic Organisms 10**:** 39-43.	(possibly *G. derjavini* or *G. teuchis*, but not identified by authors)
Schmahl, G. (1993) Up to date chemotherapy against monogenea: a review. Bulletin Français de la Pêche et de la Pisciculture 328**:** 78-81.	Trichlorfon results equivocal, Mebendazole effective against some species (possibly effect of water quality parameters), praziquantel effective, Toltrazuril effective, HOE092V (under development at time of publication, I have no further information) effective.
Schmahl, G. Taraschewski, H. (1987) Treatment of fish parasites 2. Effects of praziquantel, niclosamide, levamisole-HCl and metrifonate on Monogenea (*Gyrodactylus aculeati*, *Diplozoon paradoxum*). Parasitology Research 73**:** 341-351.	Praziquantel, niclosamide and levamisole-HCl effective against *G. aculeati* on sticklebacks
Soleng, A. & Bakke, T. (1991) Experimental studies on the salinity tolerance of *Gyrodactylus salaris* Malmberg, 1957. Bulletin of the Scandinavian Society of Parasitology 1**:** 79.	*G. salaris* can survive for up to 5 days at 10‰, over 54 days at 7.5‰. Mean extinction time at 10‰ was 29 hours at 12˚C and 55 hours at 6˚C. Mean extinction time at 7.5‰ was 41 hours at 12˚C, 95 hours at 6˚C. Max. survival time at 12˚C was 54 days.
Soleng, A. Bakke, T. (1993) Salinity tolerance of *Gyrodactylus salaris* Malmberg (Monogenea) infecting presmolts of Atlantic Salmon, *Salmo salar*. Experimental Studies. 2nd International Symposium on Monogenea, Montpelier, France, 5-7 July.	15‰ salinity, mean survival is 17 hours (max. 24 hours) at 12˚C, 32 hours (Max. 74 hours) at 6˚C. 20‰ salinity, survival mean 10 hours, Max. 12 hours at 12˚C, mean 16, max. 18 hours at 6˚C. 33‰ salinity survival max. 10 minutes at 12˚C, Max. 19 minutes at 6˚C.
Soleng, A. & Bakke, T. A. (1997) Salinity tolerance of *Gyrodactylus salaris* (Platyhelminthes, Monogenea): laboratory studies. Canadian Journal of Fisheries and Aquatic Sciences 54**:** 1837-1845.	Parasites die after a few minutes in Full-strength (33‰) sea water from freshwater. In 7.5‰ salinity, parasites survive up to 56 days. Survival time decreases with increasing salinity
Soleng, A., Poleo, A. B. S., Alstad, N. E. W. & Bakke, T. A. (1999) Aqueous aluminium eliminates *Gyrodactylus salaris* (Platyhelminthes, Monogenea) infections in Atlantic salmon. Parasitology 119**:** 19-25. Soleng, A., Poleo, A.B.S., Bakke, T.A. (2005). Toxicity of aqueous aluminium to the ectoparasitic monogenean *Gyrodactylus salaris*. Aquaculture 250 (2005) 616– 620	Parasites eliminated after 4 days in water with 202µg Al/litre. Effect of Al is concentration dependent and enhanced when pH lowered to 5.0. Suggest this might be a useful treatment in hatcheries. *G. salaris* on salmon exposed for 1 month in lab to acidic aluminium-enriched water; 45 µg Ag Al/l, pH 5.3. Infection declined noticeably after one week and after one month parasites were nearly eliminated. However remaining parasites recovered and resumed reproduction once normal water conditions restored. Treatment needs to continue until all parasites eliminated to be successful.
Steverding, D., Morgan, E., Tkaczynski, P., Walder, F., Tinsley, R.C. (2005) Effect of Australian tea tree oil on *Gyrodactylus* spp. infection of the	Tea tree oil at 3-30ppm in presence of Tween80 at 0.01% lowered prevalence and parasite burden. 30ppm lowered prevalence from 90 to 50%, abundance from 5.9 worms

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three-spined stickleback *Gasterosteus aculeatus*. *Diseases of Aquatic Organisms* 66: 29-32.	per host to 1.4. Tween80 alone also parasiticidal, reduced burden from 12.6 to 5.9 worms per host.
Tojo, J., Santamarina, M. T., Ubeira, F. M., Estevez, J. & Sanmartin, M. L. (1992) benzimidazoles against *Gyrodactylus* sp. infecting rainbow trout *Oncorhynchus mykiss*. Diseases of Aquatic Organisms 12**:** 185-189.	Benzimidazoles effective, with fenbendazole effective with no harm to fish. Some were totally ineffective. Possibly *G. derjavini* or *G. teuchis*, but species not identified in this paper
Tojo, J., Santamarina, M. T., Ubeira, F. M., Leiro, J. & Sanmartin, M. L. (1993) Efficacy of antiprotozoal drugs against Gyrodactylosis in rainbow trout (*Oncorhynchus mykiss*). Bulletin of the European Association of Fish Pathologists 13**:** 79-82.	Quinacrine HCl 100% effective in bath treatment, without signs of toxicity. Other treatments less than 100% effective. Possibly *G. derjavini* or *G. teuchis*, but species not identified in this paper
Tojo, J. L. & Santamarina, M. T. (1998) Oral pharmacological treatments for parasitic diseases of rainbow trout *Oncorhynchus mykiss*. II: *Gyrodactylus* sp. Diseases of Aquatic Organisms 33**:** 187-193.	Triclabendazole and nitroscanate effective, another 22 compounds ineffective. Possibly *G. derjavini* or *G. teuchis*, but species not identified in this paper

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APPENDIX 4 Additional information on Disease Responses

1. Résumé of relevant legislation and copies of notices.

1.1 List of relevant legislation is given in Appendix 1 (page 29).

1.2 Appendix 1 also sets out the powers of the various agencies and inspectors in relation to specific pieces of legislation.

1.3 The powers of Ministers to appoint inspectors are detailed in the Aquatic Animal Health (Scotland) Regulations 2009 Appendix 1, (page 29).

1.4 Water bailiffs are appointed by DSFBs under powers listed in Appendix 2, paragraph 22 (page 42).

2. Summary of protective measures

2.1 In the initial stages where powers exist it may be decided to impose a national standstill until the distribution of the disease is established. Thereafter restrictions may be limited to infected catchments and buffer zones. Where water transfer activities link a clean catchment to an infected one both will be subject to restrictions. Details of the requirements for surveillance sampling are contained in the Operations Manual (See Appendix 11-page 132). These requirements may be enhanced by additional scientific advice at the time.

2.2 Movement restrictions will be used to control the movements of fish, fish ova, fish feedstuffs and materials likely to carry viable infection whenever an IDN or CDN is in force. The initial action will be to ban movements to, from and within the infected zone which may include buffer zones as well as the infected catchment(s).

2.3 A risk assessment will be carried out to determine what movements may be permitted under licence. This assessment will also be used to decide on the criteria to be applied when assessing what uses of water will be permitted in the infected zone.

2.4 Surveillance sampling will be determined after a review carried out by MSS Epidemiology team in consultation with FHI and Marine Scotland, Performance and Aquaculture Division. Surveillance sampling will be used firstly to determine the extent of disease spread within Scotland, to assess the origin of disease and thus what further surveillance is needed and, after treatment, to determine freedom from disease.

2.5 Cleansing and disinfection of premises, equipment and vehicles will be determined on a case by case basis by the inspector in charge BUT it should be assumed that any licensed movement into, out of or within the infected zone will be preceded by a supervised cleansing and disinfection. Vehicles involved in licensed movements will be cleansed and disinfected before movement and again thereafter and will not be allowed to be further used until the post movement cleansing has been carried out. Local Authorities and/or MSS inspectors may carry out supervision duties.

2.6 Cleansing and disinfection of fishing & leisure pursuit equipment will be determined by whatever decision is taken on restricting these activities. In a situation where it is decided to permit fishing and leisure pursuits within an infected zone there will be no need to carry

out cleansing and disinfection UNLESS the equipment used is transferred to a non infected or buffer zone.

3. Risk assessments and options for dealing with disease

3.1 A risk assessment was carried out on *G. salaris* in 2000 and updated in 2006 by the Prevention sub group using the following terms of reference:-

"To develop preventive measures at home and abroad to exclude Gyrodactylus salaris from Scotland through the control of:

Commercial activities, including the movement of ova, live and dead fish, aquatic plants and ballast water for whatever purpose.

Research activities including fish, disease and fisheries research
Recreational activities including angling, boating and other water based activities

To develop containment measures at home to contain the spread of G salaris through the control of:

The movement of live and dead fish and their ova, for whatever purpose.

The transfer of water between catchments for whatever purpose.

The transfer of equipment associated with waterborne activities for whatever purposes."

3.2 The risk assessment categorizes risks into high, moderate or low risk and is summarized in Annex 1(page 63) to this Appendix. Whilst the risk assessment is aimed primarily at keeping *G. salaris* out of Scotland it can equally provide a basis for action to contain the spread of disease were it to enter Scottish waters.

3.3 The assessment details the likely constraints on the effectiveness of measures, the surveillance of preventative measures and which organizations have key interests.

3.4 The risk assessment highlighted a number of areas where there was a case made for improved/increased publicity over a wide range of issues. These issues are dealt with in Annex 9 of Appendix 5 (page 87) on communications.

3.5 The Dee District Salmon Fishery Board has carried out a survey of the Dee catchment which describes the physical and biological characteristics, knowledge of which may be required in making a decision to contain or eradicate *Gyrodactylus salaris.* A copy is at Annex 2 (P65) and can be used as a template in assessing other catchments.

4. Key Events and Action Flow Charts

4.1 The Operations Manual (Appendix 11 page 123) contains a series of action flow charts which describe what actions need to be taken to deal with the following events:-

- Dealing with the suspicion that *G salaris* may be present,

- Placement of movement restrictions,
- Establishing a surveillance zone and
- Sampling sites following disease confirmation.

4.2 The key administration and policy events will be in support of the following activities:-

- Keeping Ministers fully briefed
- Setting up, managing and providing staff and other resources for DSG, NDCC and LDCC(s)
- Defining the infected area(s) and agreeing the surveillance, containment and eradication strategies
- Implementing the Communications Strategy including liaison with media (See Appendix 6 Para 5.2 page 89)
- Liaison with other Scottish Government Directorates, SGER, Enforcement and Advisory bodies and Stakeholder Groups.
- Emerging policy issues (See Appendix 6 Para 6 page 91)

5. Action on confirmation of disease

5.1 Samples from a first positive case and periodically thereafter will be submitted to the OIE Reference Laboratory for *G. salaris* for corroboration.

5.2 In the initial stages there may be a need to impose a national standstill until the distribution of the disease is established. This will involve consultation with Defra in relation to the Tweed and Border Esk Rivers.

5.3 On receipt of confirmation that disease exists, based on laboratory reports, the head of DSG will immediately notify Ministers and instruct MSS to inform the owner of the results. NDCC will be set up and the Operations Manual. Put into use if these actions have not already been implemented at suspicion stage.

5.4 DSG will meet as soon as possible and ensure that a press release is prepared and that arrangements are made for briefing the media. It is likely that a Minister will take first briefing but a nominated official may stand in if a Minister is not available.

5.5 DSG will notify Defra of positive results from both MSS and OIE giving such details as are available to enable Defra to notify EC and OIE. (See Appendix 5 Annex 2 Page 77)

5.6 Head of DSG will issue instructions to all SG Departments specifying their roles and ensure that all Enforcement Bodies are notified.

5.7 Head of DSG will ensure that all stakeholders are contacted by most expeditious means (confirmed in writing) to alert them to the situation and to make arrangements for the first Stakeholder meeting.

5.8 Head of MSS sets up NDCC according to instructions in Operations Manual and notifies Head of DSG of staff and equipment requirements.

5.9 Head of NDCC arranges meeting of relevant Agencies at MSS in Aberdeen

5.10 MSS evaluate situation, inform DSG and implement detailed investigation to establish the extent of the disease, any movements to be traced and recommendations to extend infected zone and movement controls.

6. Protocols to declare freedom from disease

6.1 The protocols to declare freedom from disease will be based on a programme of investigations determined by epidemiologists in consultation with FHI and the Expert Group. Details of the sampling protocols to be followed are in the Operations Manual (See Appendix 11 page 123). These meet the Commission Decision requirements as per P139-40. The aim of the protocols will be to ensure that there is no evidence of fish or parasites being present in infected zone. The consultation will also determine what criteria will be used to make a decision as to what constitutes freedom from disease. See also Section 9 of Operations Manual (Page 148)

6.2 Recently introduced fish will probably succumb to any parasites that are still in the system. Restrictions should not be lifted, if restocking is contemplated, until at least a partial restock has been completed and samples taken to determine freedom from disease. Restocking with sentinel parr in cages will be considered as a means of concentrating the susceptible host to increase the chance of detecting the parasite.

6.3 It should be noted that Norway sample treated rivers for up to 5 years before declaring a treatment a success. Sampling protocols in event of an outbreak in Scotland will be determined on advice from the Epidemiology Team.

Appendix 4 Annex 1 Risk Assessment

Risk
Dark—Highest risk
Medium—Moderate risk
Light—Low risk

Vector	Measures	Risk	Likely constraints on effectiveness of measures	Surveillance of preventative measures	Key interests
Recreational activity					
• Anglers Transmission on wet tackle & clothing Transmission via imported live bait (see movement below)	Publicity & awareness at Ports of entry to Scotland. Declarations & guidance at points of entry to water. Clear advice on disinfection procedures & ready availability of treatments.		Difficulties with enforcement at local level. Apathy amongst angling stakeholders. Difficulty in covering all sectors and convincing low-risk groups.	Enforcement at local level	Scottish Government ASFB RAFTS S&TA SFCA SANA IFM SEPA Visit Scotland
• Canoeists Transmission on wet craft, clothing and equipment	Publicity & awareness at Ports of entry to Scotland. Declarations & guidance at points of entry to water. Clear advice on disinfection procedures & ready availability of treatments.		Difficulties with enforcement at local level. Apathy amongst canoeists. Difficulty in covering all sectors and convincing low-risk groups.	Enforcement at local level	SCA BCU Sportscotland Visit Scotland
• Leisure craft & towed vessels Transmission on and within craft	Publicity & awareness at Ports of entry to Scotland. Declarations & guidance at points of entry to water.		Potential lack of understanding of risks/consequences by users. Difficulties with enforcement at local level.	Enforcement at local level	British Waterways HMRC Visit Scotland
• Rafting activity Transmission on wet craft and clothing	Publicity & awareness at Ports of entry to Scotland. Declarations & guidance at points of entry to water.		Potential lack of understanding of risks/consequences by users. Difficulties with enforcement at local level.	Enforcement at local level	SRA Visit Scotland Sportscotland
• Other water activity • Gold panning • Canyoning Transmission on clothing/equipment	Publicity & awareness at Ports of entry to Scotland.		Making connection between participant's activity and risks could be difficult.		Visit Scotland

• Fishery/aquatic researchers Transmission on clothing/equipment	Publicity & awareness at Ports of entry to Scotland. Declarations & guidance at points of entry to water. Clear advice on disinfection procedures & ready availability of treatments.		Relatively small sector. Guidelines could be produced with some effectiveness.	Clear national protocols for operators	
Commercial Activity					
Movement of ova	Publicity & awareness at Ports of entry to Scotland. Statutory controls and protocols for treatment.		Persons operating Outwith the law. Lack of effective enforcement activity.	Statutory enforcement & Random inspections	Scottish Government SSPO BTA
Movement of live fish (salmonids)	Publicity & awareness at Ports of entry to Scotland. Statutory controls and protocols for treatment. 'Border' issues.		Persons operating outwith the law. Lack of effective enforcement activity. Political issues associated with EU trade issues.	Statutory enforcement & Random inspections	Scottish Government SSPO BTA
Movement of live fish (cyprinids)	Publicity & awareness at Ports of entry to Scotland. Statutory controls. 'Border' issues.		Persons operating outwith the law. Lack of effective enforcement activity.	Statutory enforcement & Random inspections	SFCA
Movement of live fish (ornamentals)	Statutory controls. 'Border' issues.		Persons operating outwith the law. Lack of effective enforcement activity.	Existing regulatory controls	
Ballast water movement					
Import of aquatic plants					

Appendix 4, Annex 2 River Dee Catchment Characteristics
Gyrodactylus salaris Task Force

1. Flow Information

Mean daily flow - 46 cumecs, Maximum – 879 cumecs, Minimum – 5 cumecs (post abstraction). Data collected at Park over the period 1975-2005

2. Length of Main Stem and Major Tributaries

Total river and stream length = 1,299 km
The length of each tributary is shown in Appendix 1 (page 65).

3. Location and Size of Lochs

Loch	Outflow Grid Reference	Volume (ML)
Callater	NO 17761 84333	1080
Muick	NO 29957 84197	785000
Davan	NJ 44589 00675	708
Kinord	NO 44630 98959	1160
Aboyne	NO 53502 99727	280
Skene	NJ 78395 06938	1700

There are a number of small lochans around the catchment, but no data is available on them.

4. Presence of Water Abstraction / Transfer Sites

The following information will be required: - the water course and map reference of the abstraction point and the volume of abstraction. This information can be obtained from Scottish Water if required.

SEPA maintain data on all major abstraction sites and can provide this 365 days per annum. There is a single point of contact through SEPA's Communication Centre (Tel: 0800 80 70 60, e-mail: scc@sepa.org.uk)

Details of small private abstractions are held by Environmental Health Departments of the appropriate Local Authorities.

Note that there are no known out of catchment water transfers.

5. Location of Weirs and Fish Passes

A schematic of locations is given in Appendix 2 (page 66). Current condition of weirs is unknown.

Type	Watercourse	Grid reference	Weir height (m)	Comment
Mill impoundment	Corriemulzie Burn	NO 112 889	Approx. 8m.	Mill no longer water powered, dam breached
Mill impoundment	Gelder Burn	NO 247 932	Approx 1.5m	Sawmill still operational.
Fire pond impoundment	Ballochbuie Burn	NO 210 911	Approx. 2m	Small pond
Mill impoundment	Chapel Burn (Muick)	NO 362 943	Approx. 2m	Used as put-take fishery
Raised loch	Birsemore Loch	NO 527 975	Approx 2m	Sawmill impoundment-disused
Mill impoundment	Dess Burn	NO 570 998	Approx 1.5m	Sawmill impoundment-disused
Mill weir (x2)	Cattie Burn	NO 573 954	Approx 1.5m	Sawmill impoundment-disused
Mill weir	Water of Feugh	NO 574 911	Approx 1.5m	Partial diversion to sawmill lade
Mill weir	Water of Feugh	NO 590 915	Approx 1.5m	Partial diversion to sawmill lade
Mill weir	Coy Burn	N0 742 962	Approx 3m	Impassable mill dam
Raised loch	Leuchar Burn (Culter)	NJ 784 069	Approx 2m	Loch of Skene
Mill weir	Leuchar Burn (Culter)	NJ 784 061	Approx 10m	Garlogie dam-currently drained
Mill weir	Culter Burn	NJ 834 011	Approx 10m	Impassable mill dam

6. Presence/Absence of Fish Fauna

The following species are known to be present within the Dee catchment. At present distribution information is not known.

Atlantic salmon	Trout (brown & sea)	Eel
Brook lamprey	River lamprey	Sea lamprey
Minnow	3-spined stickleback	Pike
Perch	Rainbow trout	Bream *
Roach *	Tench *	Char **
Brook Trout		

* Stocked into ponds adjacent to catchment but unknown if present within the main catchment.

**Anecdotal information that char are present.

7. Relevant Designations

The main stem of the River Dee, and major tributaries, have been designated as a Special Area of Conservation for Atlantic salmon, otters and freshwater pearl mussels. The upper catchment lies within the designated Cairngorms National Park. There are National Nature Reserves present, although their designation status is being re-evaluated at Dinnet.

8. Presence/Absence of Fish Farming

There are no commercial fish farms operating within the catchment. Rainbow trout fisheries are operated at the following locations:

Corriemulzie pond	NO 10941 87724
Braemar pond	NO 13750 90533
Tullich pond	NO 39165 98292
Muick ponds (2, close together)	NO 35955 93610
Tanar pond	NO 46790 95215
Dess pond	NJ 57491 01769
Strachan pond	NO 66988 92272
Raemoir pond	NO 69663 97757
Crynoch pond	NO 86383 97221
Loriston Loch	NJ 94008 01234

9. Angling Information

The Dee District Salmon Fishery Board is the statutory body charged with protecting and managing salmon stocks across the Dee catchment. The Board holds a contact list for all salmon fishery proprietors across the catchment. Tel: 013398 80411

The Dee Salmon Fishery Improvement Association represents salmon fishery proprietors along the river. Tel: 013398 85341.

10. Presence / Absence of Wild Fish Hatcheries

i) Mill of Dinnet – operated by Dee District Salmon Fishery Board, under review but currently 70,000 eggs to eyed egg stage.

ii) Dess & Aboyne – operated by Dess & Aboyne Working Group in Aboyne, circa 50,000 eggs to eyed egg.

iii) Invercannie – operated by Middle Dee Group, circa 25,000 eggs to eyed egg.

All hatcheries abide by the Dee Hatchery Code which stipulates the terms and conditions of stripping and stocking, and is managed by the Board.

11. Levels of Monitoring

Up to and including 2005 the majority of electric fishing performed on the catchment was by the Dee District Salmon Fishery Board. From 2006 onwards it will be performed by the River Dee Trust. Data from 2000 onwards is SFCC compliant. Board and Trust data is collected from approximately 100 sites across the whole catchment on an annual basis.

MSS undertake annual electric fishing in the upper catchment, which conform to SFCC protocols.

Vakki fish counters are operated by the Middle Dee Group on the Beltie and Cattie tributaries and data extends back to the late 1990s. A Vakki fish counter has been used on the Feardar Burn since 2002 by the Dee District Salmon Fishery Board. MSS operates two fish traps on the Baddoch and Girnock Burns, with data going back to the 1990s and 1960s respectively.

At present there is no systematic survey of the health status of fish stocks across the Dee on an annual basis. Samples are submitted to MSS on an ad hoc basis.

12. Recreational Activities

Activity	Representative Bodies
Canoeing	Aboyne Canoe Club
	Aberdeen University Canoe Club
Rowing	Aberdeen University & Aberdeen Rowing Club
Sailing	Aberdeen Harbour Board
Coarse Fishing	Dinnet & Dunecht Estates
Game Fishing	Aberdeen & District Angling Association
	Ballater Angling Association

13. Relevant Agencies on the Dee Catchment

Agency	Address
Aberdeen City Council	St Nicholas House, Broad Street, Aberdeen, AB10 1GZ
Aberdeenshire Council	Viewmount, Arduthie Road, Stonehaven, AB39 2DQ.
Aberdeen & District Angling Association	162 North Deeside Road, Aberdeen, AB13 0HL
Aberdeen Harbour Board	16 Regent Quay, Aberdeen, AB11 5AE
Ballater Angling Association	Unknown
Cairngorms National Park	Albert Memorial Hall, Station Square, Ballater, AB35 5QB
Crown Estate	6 Bell's Brae, Edinburgh, EH4 3BJ
Dee District Salmon Fishery Board	4 Mill of Dinnet, Aboyne, Aberdeenshire, AB34 5LA
MSS Marine Laboratory	PO Box 101, Victoria Road, Torry, Aberdeen, AB11 9BD.
Forest Enterprise	1 Highlander Way, Inverness
Grampian Police	Queen Street, Aberdeen, AB21 9AS
Health & Safety Executive	Lord Cullen House, Fraser Place, Aberdeen, AB25 3UB
National Farmers Union of Scotland	Ballater Road, Aboyne, AB34
RSPB	10 Albyn Terrace, Aberdeen
SEPA	Greyhope House, Greyhope Road, Torry, Aberdeen, AB11 9RD
SNH	17 Rubislaw Terrace, Aberdeen, AB10 1XE
Scottish Water	Craig Mitchell House, Flemington Road, Dundee, KY7 5QH
Upper Deeside Access Trust	Aboybe Castle Business Centre, Aboyne, AB34 5JP.

Appendix 1 Length of Each Watercourse

Water Course	Main Stem Length (km)	Length of Significant tributaries (km)
River Dee	133.7	-
Geldie Burn	16	17.8
Bynack Burn	8.9	8.7
Lui Burn	27.4	3.3
Ey Burn	4.6	26.5
Corriemulzie Burn	4.4	-
Water of Quoich	5.7	7.6
Clunie Water	18.4	25
Allt Slugain	5.7	5.6
Allt Dourie	4.5	-
Glen Beg Burn	.1	-
Garbh Allt	7.8	9.2
Feardar Burn	7.9	10.9
Gelder Burn	9.5	7.4
Coinlach Burn	3.4	1.8
Piper Burn	5.5	4.3
Girnock Burn	11.2	8.4
River Gairn	32.4	84.1
River Muick	26.1	60.6
Glen Muick House Burn	.8	-
Tullich Burn	9.2	4.1
Dinnet Burn	13	19.2
Culsten Burn	4.3	2.2
Pollagach Burn	.2	2
Water of Tanar	0.9	41.7
Fungle Burn	5.6	-
Tarland Burn	18.4	32.6
Birse Burn	7.2	6.1
Rose Burn	3.2	-
Dess Burn	10.2	15.3
Neil Burn	2.5	-
Cattie Burn	11.6	8.4
Beltie Burn	20.7	29.8
Water of Feugh	9.2	83.2
Water of Dye	23.5	52.3
Burn of Bennie	.4	-
Balbridie Burn	5.3	-
Coy Burn	15.6	15.5
Sheeoch Burn	14.9	8.5
Drumallan Burn	4.6	2.3
Altries Burn	3.9	-
Culter Burn	25	35.1
Crynoch Burn	12.4	4.8
Aberdeen burns	19.9	-
Sub-totals	654.7	644.3
Total	**1299**	

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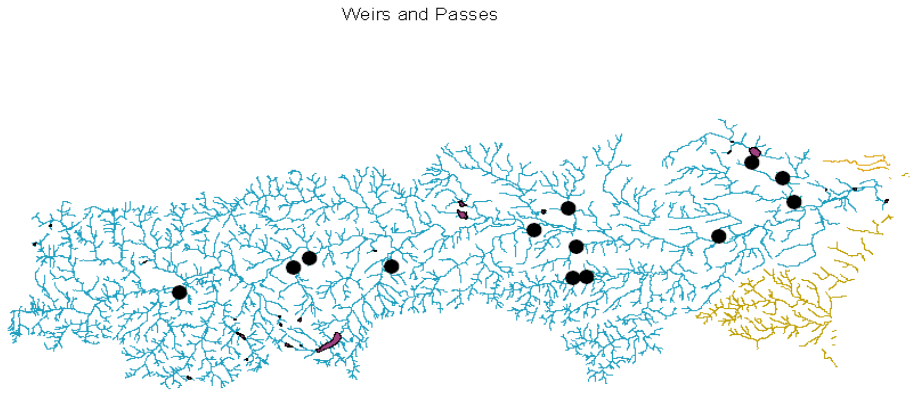
Appendix 2: Additional weirs and passes in the Dee catchment.



APPENDIX 5 Communications Issues and Strategy

1. This appendix details the communication issues that will need to be addressed during an outbreak, describes the role of the Communications Co-ordinator and provides guidance and suggested templates for reports, letters, agendas, press releases and Question and Answer briefs. These are not meant to be exclusive and it will be the responsibility of Communications Co-ordinator to amend the templates to take account of the situation as it exists when documents are produced.

2. It is important that everyone involved in dealing with an outbreak of *G. salaris* in Scotland is kept fully briefed, understands their role and provides relevant information, when it is required, to assist the decision making process. A priority will be to ensure that the staff in the field are fully aware of Scottish policy but it will also be vital that appropriate communication is undertaken with other parts of the Scottish Government and key stakeholders (See Appendix 2 -page 36) who will have a key role in disseminating information to their members. It is also important that any person or organisation that may be impacted by *G. salaris* are also kept informed.

3. The head of DSG will appoint a senior member of Marine Scotland to be the Communications Co-ordinator to take responsibility for all communications issues. The Communications Co-ordinator must ensure that the communications process is actively managed so that relevant information is passed expeditiously to those who need it and any responses required meet the deadlines imposed.

4. The Communications Co-ordinator will use all methods at his/her disposal to ensure that information is disseminated to those who need to know and to respond to requests for information. Thus in addition to Media briefings use will be made of the Scottish Government website, advisory and explanatory leaflets, help lines and letters to specific organisations and individuals. The Communications Co-ordinator will establish links with similar individuals in the Enforcement sector and with stakeholder groups to ensure that best use is made of all the available resources and information so that the Scottish Government, the Fisheries sector and industrial, service and leisure users of water are kept fully briefed on developments that affect them.

5. The Communications Co-ordinator will liaise with the Communications Directorate on all issues relating to media involvement and, in conjunction with Communications Directorate, will organise media briefings and ensure that relevant personnel, including Ministers, are available and fully briefed on the issues to be presented. Arrangements will be made immediately on suspicion and/or confirmation of an outbreak for a media briefing attended by the Minister and senior officials from DSG. Regular briefings will be held thereafter and news releases will be issued covering disease updates, strategy and policy. The Communications Directorate will be responsible for liaising with Defra on responsibilities related to handling media briefing given Defra's lead role.

6. Regular progress reports will be placed in the Scottish Parliament Information Centre (SPICe) to keep MSPs informed of the progress in controlling the disease. These reports will be prepared by the Communications Co-ordinator in consultation with DSG, Marine Scotland, Performance and Aquaculture and MSS. The aim will be to keep MSPs informed and to reduce parliamentary correspondence and questions.

7. The Communications Co-ordinator will develop a system for receiving, despatching and recording all items of communication in accord with Freedom of Information and Environmental Information legislation. He/she will also ensure that all meetings/actions are recorded in accord with instructions in force at the time.

8. The Communications Co-ordinator will be responsible for ensuring that an adequate supply of leaflets and posters on *Gyrodactylus salaris* is maintained and available for distribution. He/she will ensure that an up to date mailing list is maintained of all major organisations (See Appendix 2-page 36) to ensure that mail shots can be despatched expeditiously. He/she will liaise with these organisations to ensure that they have sufficient material to distribute to their members.

9. The following minutes/letters are provided as annexes to this Appendix:-

- Annex 1 (page 75) Draft Minute to Minister reporting suspicion/confirmation or negative case of disease. Minutes should include sufficient details of the case to give Minister an overview of the situation. Fuller briefing will be provided if Minister is required to give press conference.

- Annex 2 (page 77) Draft Minute to DEFRA, reporting suspicion/confirmation or negative case of disease

- Annex 3 (page 79) Draft letter to Enforcement Bodies and affected Local Authorities. This letter will be sent to enforcement bodies listed in Appendix 2 Section A and to local authorities in the infected area(s). It will give a résumé of the situation and refer them to their copy of this plan for further guidance on the actions that they need to take.

- Annex 4 (page 81) Draft letter to stakeholders

  A draft letter has been prepared but this should be tailored to explain what the current disease situation is, what measures have been put in place to deal with the situation and what action they are being requested to take. Letter can be amended to include a number of actions that may be taken depending on what decisions have been taken to deal with the outbreak. It may be appropriate to have an initial letter to core stakeholders with a second letter to all stakeholders once disease picture becomes clearer and control decisions have been formulated.

- Annex 5 (page 82) Draft letter to fish farmers, riparian owners, angling clubs and organisations representing same in the infected area confirming disease and the extent of the infected and buffer zones

  A basic draft letter has been produced but this should be added to/amended to describe the situation and progress made at the date of writing. It may be decided that this should be the first in a series of letters to keep those most affected up to date.

- Annex 6 (page 83) Draft letter to affected persons/parties explaining containment and eradication policies

  This letter is intended for all non-fisheries water users e.g. industrial users (Distilleries etc), service industries (e.g. Hydro—Electric companies) and leisure industry (e.g. canoe

clubs). More detailed specific letters will be required to individual companies/groups if it is envisaged that specific control/eradication methods will affect them individually.

- Annex 7 (page 85) Draft agendas for DSG, and Stakeholder Meetings

  Draft agendas that can be used for all meetings will ensure that key issues are not omitted from discussion. One off items can be dealt with as AOCB. All meetings should have a written record taken. It will be for Chairs to decide if this is a full minute or a list of action points.

- Annex 8 (page 86) Draft Press Release

  A variety of Press Releases will be required depending on circumstances. A list of the most likely releases that will be needed are given in Annex 8. Press Releases should follow normal protocols and be agreed between the Communications Coordinator and Communications Directorate. If press releases include specific issues that involve other Departments and/or External Agencies it will be necessary to agree a line with them.

10. A question and answer brief has been prepared by MSS (see annex 6a on P164). This will be updated in conjunction with DSG, the Expert Group, Enforcement Bodies and Marine Scotland. This basic draft will be kept up to date detailing answers to questions on clinical signs of disease, the current situation in Europe, legal powers available to Ministers, biosecurity issues and import controls. The brief can be expanded to describe the progress of the outbreak and to cover issues raised by the implementation strategy agreed by Ministers. This may be developed to deal with environmental and public health concerns.
The Q & A brief will be circulated to all bodies listed in Appendix 2 (page 36) and will be posted on the Marine Scotland web pages. The Communications Co-ordinator will liaise with Defra to ensure that consistent messages are given particularly in relation to the Tweed and the Border Esk.

11. MSS will also set up and man a helpline to provide information to the industry and the general public. Other groups within Scottish Government who have expertise in this field e.g. agricultural staff, may also be available to assist.

12. Experience from Norway strongly suggests that anglers have a vital role to play in identifying early indications of disease, in reporting these indications and in disseminating information among the local communities on precautions that need to be taken. Every effort should be made to gather information from anglers, biologists, gillies etc that may help inspectors and epidemiologists to develop sampling programmes. Marine Scotland will be responsible for ensuring that this group are kept fully briefed on issues related to *G salaris* and that their representative organisations are supplied with advisory literature to disseminate both before and during outbreaks. Norwegian experience further emphasises that face to face contact with local stakeholder groups should be arranged for the affected area, especially where containment is required, or where local assistance will be required to carry out effective containment or eradication strategies.

13. The Prevention sub group identified a series of specialist groups that could be targeted with publicity re *G.salaris*. These are listed in Annex 9 (page 87). They also made recommendations for developing new publicity. These recommendations will be reviewed and if adopted, material will appear in future versions of this plan.

Appendix 5

Annex 1 Minute to Minister reporting suspicion and/or confirmation of disease.

From: Head of DSG
Marine Scotland
Date

PS/Cabinet Secretary for Rural Affairs and Environment

***GYRODACTYLUS SALARIS* –REPORT OF SUSPECT/ CONFIRMED/ NEGATIVE CASE**

Purpose

To alert the Cabinet Secretary to the existence of a suspect/confirmed/negative case of *Gyrodactylus salaris*

Priority

Urgent

Background

1. *Gyrodactylus salaris* is an external parasite of Atlantic salmon with the potential to cause widespread severe loss to the salmon fishing industry in Scotland. The parasite is widespread in Norway and has caused substantial loss both in fish stocks and in financial income to dependant communities.

2. *Gyrodactylus salaris* is a Notifiable disease of salmonids and is notifiable under the Aquatic Animal Health (Scotland) Regulations 2009.

Update

3. *Either*

- Marine Scotland Science (MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)*** and have been unable to rule out the presence of the parasite. They have served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. Results are awaited.

Or

- Marine Scotland Science (MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)*** and were unable to rule out the presence of the parasite. They served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. The laboratory has now confirmed the presence of *Gyrodactylus salaris* and samples have

been despatched for final confirmation by the OIE reference laboratory as is standard procedure in such cases.

Or

- Marine Scotland Science (MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)*** and were unable to rule out the presence of the parasite. They served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. The laboratory has now confirmed the presence of *Gyrodactylus salaris* and samples were despatched for corroboration by the OIE reference laboratory as is standard procedure in such cases. OIE have now confirmed the positive result.

Or

- Marine Scotland Science (MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)*** and were unable to rule out the presence of the parasite. They served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. The laboratory have reported that the samples were negative for *Gyrodactylus salaris.*

4. Investigations are continuing by MSS staff on behalf of the Scottish Government to find the source of disease and also to determine its spread. We have to assume, given no evidence to the contrary that the disease may be affecting several Scottish waters. Head of the Disease Strategy Group(DSG) will wish to discuss with you the imposition of a Scotland wide standstill on the movement of live fish, fish eggs and fish feed as a means of limiting disease spread until the distribution of the disease is established.

5. Communications Directorate will arrange a media briefing. It is likely that you will face detailed questions on the programme for control and eradication of this disease and how it has arrived in Scottish waters. Officials are preparing a press statement and a brief on likely questions.

NB Delete paras 4& 5 when reporting negative result
Head of DSG
Date
Ext

Copy List
PS/Minister for Environment
Special Advisors
Communications Directorate
Head of NDCC
Team Leaders Marine Scotland
SGLD

Appendix 5

Annex 2 Minute to Defra reporting suspicion , confirmation and/or negative case of disease.

From: Head of DSG
Marine Scotland
Date

Head of Fisheries Defra

***GYRODACTYLUS SALARIS* –REPORT OF SUSPECT/ CONFIRMED/ NEGATIVE CASE**

Purpose

To alert Defra to the existence of a suspect/confirmed/ negative case of *Gyrodactylus salaris*

Priority

Urgent

Update

Either

- Marine Scotland Science(MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)*** and have been unable to rule out the presence of the parasite. They have served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. Results are awaited.

Or

- Marine Scotland Science(MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)***and were unable to rule out the presence of the parasite. They served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. The laboratory has now confirmed the presence of *Gyrodactylus salaris* and samples have been despatched for final confirmation by the OIE reference laboratory as is standard procedure in such cases.

Or

- Marine Scotland Science(MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)***and were unable to rule out the presence of the parasite. They served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. The laboratory has now confirmed the presence of *Gyrodactylus salaris* and samples were

despatched for corroboration by the OIE reference laboratory as is standard procedure in such cases. OIE have now confirmed the positive result.

Or

- Marine Scotland Science(MSS) have investigated a report that *Gyrodactylus salaris* may exist on the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)***and were unable to rule out the presence of the parasite. They served restrictions on the premises and submitted samples to the Diagnostic Laboratory at MSS. The laboratory have reported that the samples were negative for *Gyrodactylus salaris.*

Head of DSG
Date
Ext
Copy List
PS/Minister for Environment
Special Advisors
Communications Directorate
Head of NDCC
Team Leaders, Marine Scotland.
Chief Veterinary Officer (UK)
Chief Veterinary Officer (Scotland)
Director Cefas
SGLD
Head of Scotland Office

Appendix 5

Annex 3 Letter to Enforcement Bodies (See Appendix 2) and Local Authorities.

Dear

***GYRODACTYLUS SALARIS* –REPORT OF SUSPECT/ CONFIRMED CASE**

Marine Scotland Science (MSS) has investigated a suspect case of *Gyrodactylus salaris* at the premises of ***(insert name and address if a fish farm or name of the water if in wild salmon)***. They have been unable to rule out disease and have submitted samples to the Diagnostic Laboratory at MSS

OR

Samples submitted to the Diagnostic Laboratory are positive and an outbreak of *Gyrodactylus salaris* is confirmed.

Gyrodactylus salaris is a Notifiable disease of salmonids and is notifiable under the Aquatic Animal Health (Scotland) Regulations 2009.

Gyrodactylus salaris is an external parasite of Atlantic salmon with the potential to cause widespread severe loss to the salmon fishing industry in Scotland. The parasite is widespread in Norway and has caused substantial loss both in fish stocks and in financial income to dependant communities.

Investigations are continuing into how widespread the disease is in Scottish waters and into the source of this outbreak. Findings from these investigations will advise on the decision as to whether to eradicate the disease or whether containment is the only practical option. As an interim measure consideration is being given to imposing a national standstill on the movement of fish and fish products until the exact extent of the disease is known. This decision is likely to have a major impact on Enforcement Bodies, Local Authorities, the freshwater fisheries and ancillary industries and on commercial, public utility and leisure users of Scottish waters.

Enforcement Bodies and COSLA were involved in compiling a Contingency Plan to deal with an outbreak of *Gyrodactylus salaris* in Scotland. All Local Authorities and Enforcement Bodies have been provided with a copy of this plan and I would be grateful if you can now implement that part of the plan that applies to your organisation. The current plan is ***the Fourth Edition*** If you do not have this version please contact:-

Performance and Aquaculture Division
Scottish Government
Area 1B North
Victoria Quay
EDINBURGH

EH6 6QQ

Tel: 0131-244-6225

to obtain an up to date copy electronically.

The Scottish Government will be organising the first meeting of the National Stakeholder Group shortly. The aim will be to up date participants on the disease situation and to take soundings on our proposals to deal with the disease. Representatives of the freshwater fisheries industry and other users of water will also be present. It will be helpful if your representative(s) are briefed on your specific roles in the plan (Appendix 2). In addition the details in Appendix 3 together with the results of investigations, described above, will guide our plan to deal with this disease outbreak.

Whatever course of action Ministers decide upon, the containment and/or eradication of this disease is likely to be a long term project probably spread over several years.

A media briefing will be held shortly and arrangements are in place to carry out a mail shot, enclosing leaflets, to all affected organisations detailed in Appendix 2 of the plan. I would be pleased if you could give this matter wide publicity within your own organisation and through contacts. If you require posters or leaflets please contact Performance and Aquaculture Division at address given earlier in this letter. We will also put details on the Scottish Government website where you can also find a copy of the Contingency plan ***(insert web address)*** and are setting up a helpline at MSS Aberdeen (***Insert telephone number).***

Yours sincerely

Appendix 5

Annex 4 Letter to Stakeholders

Dear

Outbreak of *Gyrodactylus salaris*

An outbreak of *Gyrodactylus salaris* has been confirmed at ***(insert name and address if a fish farm or name of the water if in wild salmon).*** The Scottish Government are investigating this outbreak to determine the distribution of the parasite and to trace its source. Until the results of this investigation are known we have to assume a worst case scenario that the parasite is widespread throughout Scottish waters. In view of this Ministers are considering imposing a national standstill on the movements of live fish and fish eggs until the distribution of the parasite is known.

Your organisation assisted in the production of a Contingency Plan to deal with this disease. Appendix 2 of the plan lists the roles and responsibilities of each organisation and what each could do in the event of an outbreak. Appendix 7 lists the stakeholders and the details of what will be expected of the two groups of stakeholders. The current version of the plan is ***(Insert Number)***. If you do not have this version please contact:-

Performance and Aquaculture Division
Scottish Government
Area 1B North
Victoria Quay
EDINBURGH
EH6 6QQ

Tel: 0131-244-6225

We will be contacting you shortly to arrange the first meeting of the National Stakeholder Group to discuss the disease situation and to seek views on our proposals to combat this disease. Thereafter I envisage that the group will meet regularly.

I enclose some leaflets on *Gyrodactylus salaris* which you may find useful. A mail shot is being prepared to circulate these more widely but your assistance in circulating these leaflets within your organisation would be appreciated. Further copies may be obtained from the contact point above. We will expect to keep you updated at stakeholder meetings and will issue regular media briefings.

We will be posting details on the Scottish Government website ***(insert web address)*** and are setting up a helpline at Marine Scotland Science Aberdeen (***Insert telephone number).***

Yours sincerely

Appendix 5

Annex 5 Draft letter to fish farmers, riparian owners, angling clubs and organisations in the infected area confirming disease and the extent of the infected and buffer zones

Dear

Outbreak of *Gyrodactylus salaris*

An outbreak of *Gyrodactylus salaris* has been confirmed at ***(insert name and address if a fish farm or name of the water if in wild salmon).*** Your property is within the infected catchment and subject to the conditions contained in the Aquatic Animal Health (Scotland) Regulations 2009 no movements of live fish or fish ova are now permitted. Consideration may be given to the movement of other items under licence. I appreciate that this may cause difficulties for you but unless we can contain this disease quickly irreparable damage may be done to the whole Scottish salmon industry.

The Scottish Government are investigating this outbreak to determine the distribution of the parasite and to trace its source. Until the results of this investigation are known we have to assume a worst case scenario that the parasite is widespread throughout Scottish waters. In view of this Ministers are considering imposing a national standstill on the movements of live fish and fish eggs until the distribution of the parasite is known.

I enclose a leaflet explaining what *Gyrodactylus salaris* is and the measures that need to be taken to reduce its spread. Details of the disease, of its progress and preventative measures that need to be taken to limit its spread will be posted on the Scottish Government website ***(insert web address)*** and a helpline at Marine Scotland Science Aberdeen will be set up (***Insert telephone number).*** Please use both these sources of information to keep up-dated on developments.

The Stakeholder Group will meet regularly to disseminate information and to bring concerns to the notice of Scottish Government. They will also be able to offer advice on emerging issues.

Yours sincerely

Appendix 5

Annex 6 Draft letter to affected persons/parties explaining containment and eradication policies

Dear

Outbreak of *Gyrodactylus salaris*

An outbreak of *Gyrodactylus salaris* has been confirmed at ***(insert name and address if a fish farm or name of the water if in wild salmon).*** Your property is within the infected catchment and I am writing to you to outline our intentions in dealing with this disease and how it might affect you.

The Scottish Government are investigating this outbreak to determine the distribution of the parasite and to trace its source. Until the results of this investigation are known we have to assume a worst case scenario that the parasite is widespread throughout Scottish waters. In view of this Ministers are considering imposing a national standstill on the movements of live fish and fish eggs until the distribution of the parasite is known.

I enclose a leaflet explaining what *Gyrodactylus salaris* is and the measures that need to be taken to reduce its spread. The Scottish Government will be posting details of the disease, of its progress and preventative measures that need to be taken to limit its spread on the Scottish Government website ***(insert web address)*** and are setting up a helpline at Marine Scotland Science Aberdeen (***Insert telephone number).*** Please use both these sources of information to keep up dated on developments.

We are currently considering two options to deal with the parasite. The first option is to deal with the parasite by strict movement controls on susceptible fish species and their products. The disease will eventually die out over time as the salmon stocks are depleted. The alternative is to try to eradicate the parasite by using chemical treatment of the watercourse to destroy the parasite. Both methods will have financial consequences for all the users of water and will need careful consideration with stakeholders and enforcement bodies.

It may be possible to deal with this outbreak with minimum disturbance to industrial users of water, to service industries and to the leisure industry. However you should be prepared to look at alternative ways of carrying on your activities in the event that the controls that we impose will affect your activities. Once our initial investigations in to the extent of the disease are completed we will have a clearer picture of what needs to be done to contain and to eradicate the disease.

We may have to consider banning certain recreational uses of water to prevent disease spread. It may be necessary to stop water transfer activity or if this is not possible, to include all the catchments involved in one water transfer system declare an infected area and impose restrictions over the whole area. Hydro electric power stations may have to be closed for a short period to permit treatment of the water intakes to destroy the parasite.

Once a decision has been made on how best to deal with this disease outbreak we will contact all the individuals and companies who may be affected to discuss our plans. In the meantime please view our web site or contact our helpline (see para 3 above) for further information.

Yours sincerely

Appendix 5

Annex 7 Draft Agendas for DSG and Stakeholder Meetings

AGENDA

1. Introductions

2. Apologies

3. Minutes or Action Points from Last Meeting

4. Disease Control Issues

5. Resource Issues

6. Communications Issues

7. Policy and Legislation Issues

8. AOCB

9. Resume of Actions Agreed

10. Date, Time & Place of next meeting.

Appendix 5

Annex 8 Draft Press Release

It is not possible to detail all the information that might be included in a Press Release as the precise detail will vary depending on the news being released.
Press releases are likely to be issued in the following circumstances:-

- In advance of any Ministerial statements
- To announce suspicion of disease
- To announce confirmation of disease
- To announce negative results on suspicion
- To announce imposition of restrictions either on a Scotland-wide basis or in specific areas.
- To announce removal of restrictions.
- To give a general overview of the spread of disease and the measures being taken to tackle it.
- To announce setting up of DSG, NDCC and stakeholder groups
- To announce decisions on containment and/or eradication plans.
- To announce the provision of advice to the fishing and leisure industries, commercial water users and general public.
- To announce any restrictions placed on trade by EU, UK or Scottish legislative measures.
- To advertise telephone help lines, web sites etc where information may be posted.
- To advertise any closures of specific areas, footpaths etc.
- To advertise general disease control measures and to seek co-operation from the public in supporting the measures.

The Communications Co-ordinator will be responsible for drafting any press releases, including the notes for editors, and agreeing them with Communications Directorate.
The Communications Directorate will be responsible for issuing press notices and for advising the Communications Co-ordinator of any further areas where a press release would be useful.

Appendix 5

Annex 9 Specialist Groups who may be targeted with *G. salaris* publicity material on regular basis.

1. Specialist Angling tour operators operating to/from Scandinavia and other European countries,
2. Other travel service providers to/from same countries e.g. ferry operators and airlines,
3. High risk airports and seaports,
4. Salmon fishing proprietors,
5. District Salmon Fishery Boards,
6. Fisheries Trusts,
7. Commercial Still Water Fisheries,
8. All Angling Clubs and Associations,
9. Online booking angling websites,
10. Angling Hotels,
11. Registered fishing guides,
12. Sporting agents,
13. Aquatic research establishments,
14. Holders of electro-fishing licences and
15. Visit Scotland

It is envisaged that each organisation be contacted annually and provided with up-to-date publicity. In the event of an outbreak each could be asked to implement disinfection and other preventative measures within their areas of responsibility.

Appendix 6 - Command and Control

1. This Appendix deals with the management structures in place within Scottish Government that will be used to manage any outbreak. The Appendix also identifies key post holders and the job descriptions of members of the DSG. Job descriptions for key post holders at Marine Scotland Science (MSS) are given in the Operations Manual at Appendix 11 (page 123).

2. The Scottish Government response will be led and managed by Marine Scotland, Performance and Aquaculture Division (see Annex 1 & 2—pages 94 & 95) who will rely on Scottish Government departments listed in Appendix 2 Section A (page 36) to provide specialist support and to manage that support. DSG will also draw on expertise and advice from External Enforcement and Advisory Bodies listed at Section B of Appendix 2 (page 40). Individual members of these organisations may be invited to attend meetings of DSG to deal with specific issues.

3. Key Post Holders

3.1 Deputy Director of Performance and Aquaculture Marine Scotland will take on the role of Head of DSG.

3.2 The Communications Co-ordinator will be appointed by the Deputy Director of Performance and Aquaculture.

3.3 The Head of NDCC will be the AFHS Programme Director from MSS.

3.4 The Head of any LDCC will be a Senior Fish Health Inspector FHI.

4. Membership of DSG

4.1 The following post holders (responsibilities in brackets) will form the DSG:-

Deputy Director of Performance and Aquaculture (Head of DSG)
Head of Aquaculture Unit (Disease Control, welfare and disposal issues, policy issues, environment and planning consents)
Head of Fisheries (Cross Border issues, hydro-electric issues and gene banking and restoration.)
Communications Co-ordinator
AFHS Programme Director, MSS (Head of NDCC)
Director of Communications Directorate (Media liaison)
Director of Finance Directorate (Budget and payment issues)
Head of Human Resources Services (All staff matters)
Director of Scottish Government Procurement (Provision of resources)
SEPA (Environmental issues and consents)
SNH (Impact on wildlife and Habitats)
Secretariat provided by Performance and Aquaculture Division

4.2 It will be for Head of DSG to decide when individual members need to attend meetings and to co-opt other officials as required. Members of DSG may nominate deputies

to attend in their place provided they have necessary expertise. Head of DSG must ensure that there is an out of hours contact list and a contact list of nominated deputies.

4.3 Head of DSG must specify where DSG is set up and provide an OPS room from which DSG will operate.

5. Job Description of Key Post Holders in DSG and NDCC

5.1 Head of DSG will:-

- Ensure that Ministers are kept fully briefed on all aspects of outbreak
- Liaise with Defra and devolved administrations (NB it is role of UK CVO (Defra) to inform EC, Member States and OIE)
- Liaise with relevant enforcement agencies
- Set up and manage DSG
- Receive reports from NDCC and decide on surveillance, containment and eradication campaigns
- Ensure that communications strategy is implemented
- Chair meeting of National Stakeholder Group
- Ensure that Marine Scotland and NDCC have sufficient staff, accommodation and equipment to deal with outbreak
- Make arrangements for additional finance as required
- Ensure that monitoring and audit procedures are in place
- Ensure that freedom of information procedures are followed.
- Ensure that a daily brief is prepared and official records kept

5.2 Communications Co-ordinator will:-

- Support the Head of DSG in ensuring that information flows are in place and will actively manage them
- Ensure that all required responses are received by deadlines
- Arrange media briefings in consultation with Director of Communications

- Agree the content of media briefings/press releases with the Director of Communications and ensure that all staff involved in media briefing have adequate training and are fully briefed

- Ensure that stakeholders and other interested groups are kept fully updated

- Ensure that the instructions in Appendix 5 (page 72) are followed and the draft letters are despatched as agreed with Head of DSG.

- Establish and maintain links with similar post holders in the enforcement sector to ensure that best use is made of communication resources

- Ensure that publicity material is kept up to date and circulated/despatched to relevant individuals/ bodies

- Maintain contact lists

- Arrange for Scottish Government web sites to be up dated

- Prepare progress reports for Scottish Parliamentary Information Centre

- Ensure that all communications received are logged and responded to in such a way that information is readily retrievable.

5.3 Head of NDCC will:-

- Be responsible for ensuring that the policy and programmes advised by DSG are implemented.

- Set up and manage NDCC

- Represent NDCC on DSG

- Decide on the composition of the management group

- Take responsibility for ensuring that Operations Manual is used and its procedures are followed

- Ensure that staff are kept fully briefed on instructions and developments.

- Provide reports to DSG outlining events in the field and providing advice to inform policy decisions.

- Receive reports from DSG and implement the instructions on surveillance, containment and eradication campaigns

- Ensure that communications strategy is implemented on the NDCC

- Act as spokesperson for NDCC in consultation with Communications Directorate, when required
- Chair meetings of Local Stakeholder Group
- Ensure that there are sufficient staff, accommodation and equipment to enable the NDCC to deal with outbreak
- Make arrangements for resources as required
- Ensure that monitoring and audit procedures are in place
- Ensure that Freedom of Information procedures are followed.

5.4 Head of LDCC will:-

- Be responsible for setting up and managing the LDCC and reporting to Head of NDCC
- Ensure that all field operations in respect of disease investigations, tracings, sampling and epidemiology are carried out to the standards set in the relevant SOPs.
- Ensure that necessary sampling kit is available and that a transport system, to take samples to the laboratory, is in place
- Keep LDCC staff fully briefed on new instructions and developments
- Assess staff and resource needs and advise Head of NDCC of any variations required.
- Ensure that relevant Health and Safety procedures are followed
- Ensure that systems are in place to ensure that the LDCC and all its equipment are kept in a secure state.
- In the event of eradication being implemented, either lead the work or provide support for external contractors
- Ensure that wall charts, maps etc are kept up to date.

6. Responsibility for Policy Issues.

It is not possible to foresee all the policy issues that may arise in an outbreak of a new disease and if issues arise that are not covered in this section it will be the responsibility of the Head of DSG to delegate responsibility to a senior member of Marine Scotland. The major policy issues will be allocated as follows:-

6.1 Team Leader Performance and Aquaculture Team

- General Aquaculture Policy issues.

- General environment issues in liaison with SEPA, Scottish Water and Scottish Government policy divisions
- Planning consents for building of barriers in liaison with SEPA and relevant Local Authorities.
- Discharge consents in liaison with SEPA.
- Disease Control matters liaising with Head of NDCC and Epidemiology
- Issuing movement permits based on assessments provided by FHI and consideration of any policy issues
- Welfare issues both due to imposition of restrictions and to slaughter methods in liaison with Scottish Government Veterinary Team
- Disposal issues in relation to dead fish, waste from processing plants and chemical disposal liaising with SEPA and relevant local authorities.
- All policy matters involving illegal imports (NB MSS will investigate suspect illegal imports on behalf of Marine Scotland)
- Legal issues including dealing with policy issues on any claims that may be pursued.
- Liaison with SGLD on issues relating to IDNs and CDNs.
- Liaison with MSS on Preparation of cases for possible prosecution to be presented to Procurator Fiscal

6.2 Team Leader Fisheries Division

- Cross Border issues liaising with Defra and DSFBs for Tweed and Border Esk
- Hydro-electric and other water transfer issues liaising with Scottish Water, electricity generating companies and distilleries
- Gene banking and restoration in conjunction with FL Faskally

7 Responsibility for Operational Issues

MSS Aberdeen

- Carrying out all field work in relation to serving of notices and sampling
- Providing a laboratory and diagnostic service
- Providing an Epidemiology Service and risk assessments
- Maintaining the Operations manual and supporting SOPs

- Maintaining a cadre of trained staff
- Providing scientific advice to NDCC and DSG
- Liaising with Communication Co-ordinator to provide local input into media material
- Maintaining an up to date Q & A brief

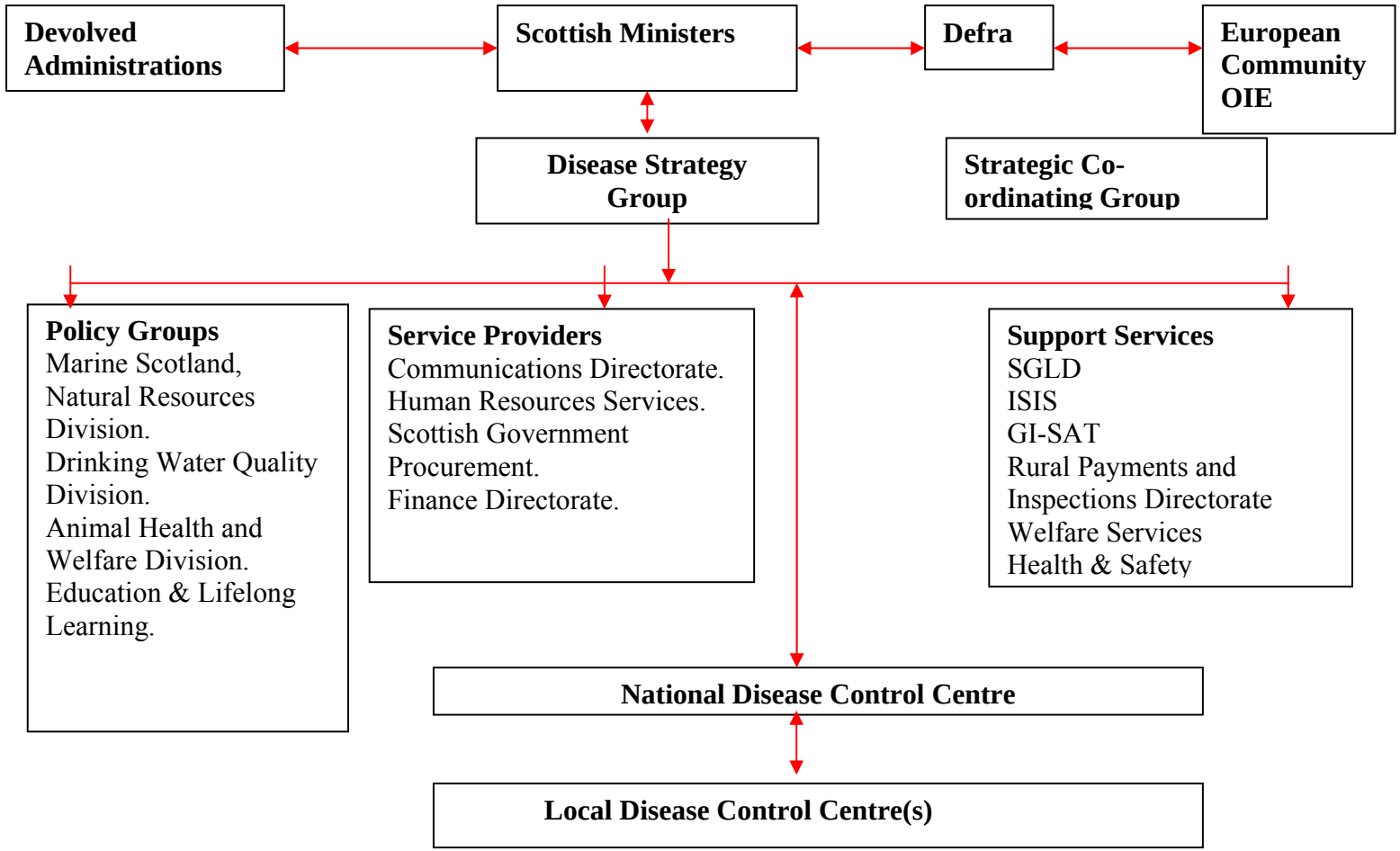
Fresh Water Laboratory Faskally

- Water Chemistry
- Gene Banking
- Restoration

8. Content, distribution and frequency of Key reports

- It will be the responsibility of the Head of DSG in consultation with Head of NDCC to determine the frequency of key reports.
- Reports should deal with unresolved issues from previous report, should update current knowledge, detail likely additional work and staff requirements and make recommendations for further action.
- Head of DSG should liaise with other senior management colleagues to determine what other information they may need.
- Each LDCC should submit reports to Head of NDCC highlighting the main issues and outstanding work.

Appendix 6 Annex 1 Command and Control— Scottish Government Management Structure

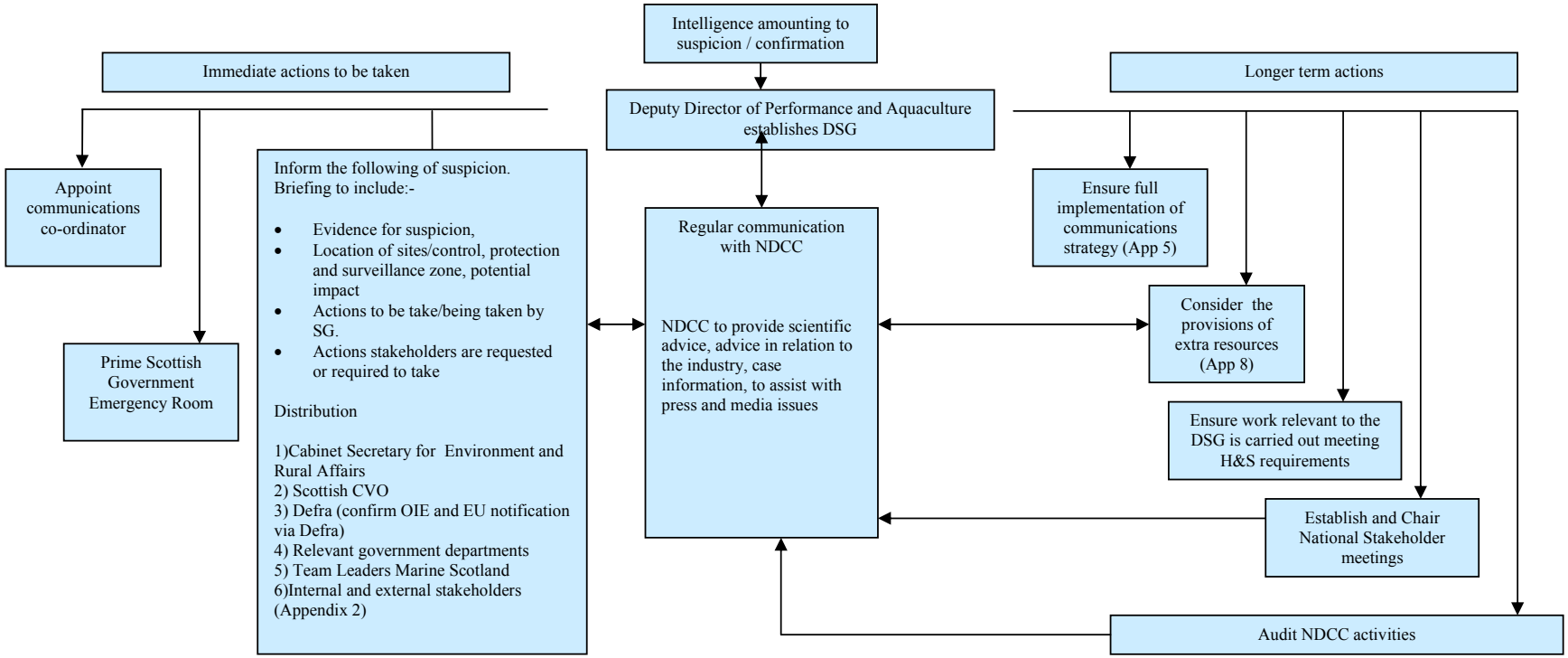


Appendix 6 Annex 2 Structure and Responsibilities for *Gyrodactylus salaris* Marine Scotland

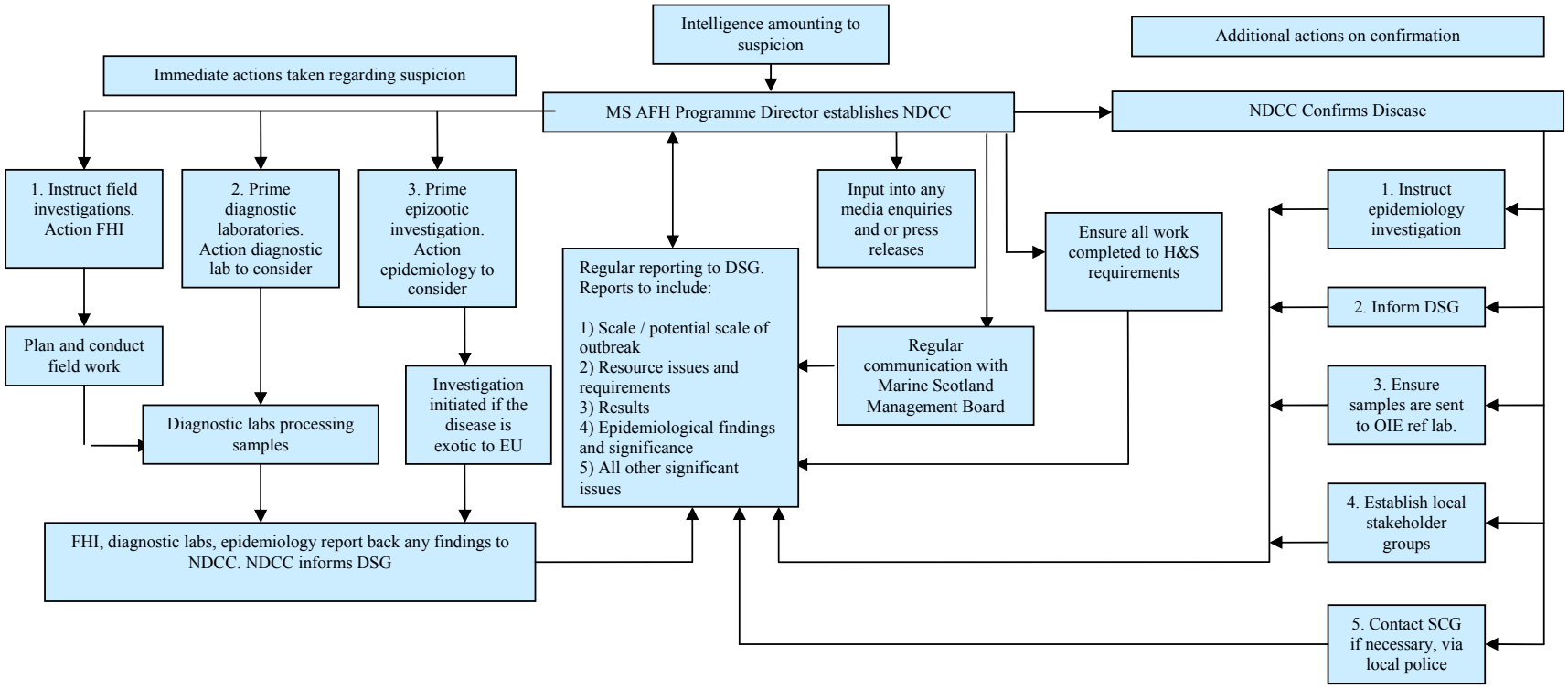
Lead Responsibility- Deputy Director of Performance and Aquaculture,

Marine Scotland Aquaculture Unit	**Marine Scotland Fisheries Division**	**Marine Scotland Science Aquaculture and Fish Health**	**Marine Scotland Science Fresh Water Laboratory**
Farmed fish and shellfish disease control, inc fish and shellfish waste disposal policy; and R&D.	Wild salmon and freshwater fisheries policy.	Notifiable Diseases of fish	Environmental Issues
Sea lice initiative. Invasive non-native species	Aquatic conservation, ecology and wildlife policy.	Disease Surveillance	Fish Genetics and Biodiversity
Secretariat for the Aquaculture Health Joint Working Group.	Sustainable development of fisheries	Contingency Plans	Fish management and Ecology
Strategic Framework for Aquaculture.		Inspection of fish farms Import controls	
Tripartite Working Group.		Monitoring compliance with Codes of practice	
Sponsorship of industry, economics and co-ordination of Ministerial engagements/ briefing.		Diagnostic and Advisory Service	
Environment and planning consents; location R&D.			

Appendix 6 Annex 3 DSG Actions in the event of suspicion and confirmation



Appendix 6 Annex 4 NDCC Actions in the event of suspicion and confirmation



Appendix 7 - Composition and Roles of National & Local Stakeholder Groups

1. **National Stakeholder Group**

1.1 The National Stakeholder Group will have, as its main function, the remit to discuss and act as a sounding board on national policy being used and developed to contain and/or eradicate the outbreak. To this end the members will be speaking as representatives of the organisations that they represent and will be expected to act as primary channels of communication to their own organisation. It is not the function of the group to deal with individual case issues unless there are national policy considerations in play. The group has a major role to play in establishing a consensus opinion, in developing a publicity/media strategy to deal with the developing outbreak and in bringing the concerns of their members to Scottish Government's notice.

1.2 The Head of DSG, in consultation with group members, will decide on the frequency and venue of meetings. It is likely that meetings will be in Edinburgh although video conferencing could be used if members of the group have access to such facilities.

1.3 The National Stakeholder Group will comprise those organisations and groups that have an influence Scotland wide and can make comment on behalf of their members on emerging policy and statutory issues.

1.4 It will be the responsibility of the Head of DSG to decide on the composition of the National Stakeholder Group and to decide whether it would be appropriate to form sub groups to discuss specific issues e.g. movement controls. It is likely that in most circumstances the National Stakeholder Group should contain representatives of the following bodies:-

1.4.1 External Enforcement and Advisory Bodies

Local Authorities
Police
Scottish Environment Protection Agency (SEPA)
Scottish Natural Heritage (SNH)
Association of Salmon Fishery Boards
Scottish Water

1.4.2 Other Groups

Fish Veterinary Society
Rivers and Fisheries Trusts Scotland (RAFTS)
Scottish Salmon Producers' Organisation
British Trout Association
Scottish Anglers National Association (SANA)
Scottish Federation for Coarse Angling
Atlantic Salmon Trust

Salmon and Trout Association
Scottish Fisheries Co-ordination Centre
Ordnance Survey
Hydro Electric Industry
Scotch Whisky Industry
Sportscotland representing Leisure Industry
Scottish Canoe Association
Visit Scotland
Scottish Society for the Prevention of Cruelty to Animals (Scottish SPCA)

1.5 In order to achieve a focussed discussion the number of representatives from each organisation will be limited to two. If the nominated representative cannot attend nominated deputies may replace them for specific meetings.

1.6 The Scottish Government will be represented by delegated members of the DSG & NDCC who are responsible for controlling the outbreak. The Head of DSG will also be able to co-opt members of Scottish Government Groups (P16 paragraph 3.13) to provide information to the National Stakeholder Group as and when necessary.

2. **Local Stakeholder Groups**

2.1 The Local Stakeholder Group will have, as its main function, the remit to discuss and resolve issues being dealt with by the NDCC at local level to contain and eradicate disease. Members should have a good knowledge of local conditions and be able to act on behalf of their members. They may wish to comment on national issues if their experience in dealing with the disease at local level suggests that changes to national policy would be beneficial in the resolution of the outbreak.

The Group has a role to play in developing a local consensus and progressing publicity campaigns at local level.

2.2 The Head of NDCC, in consultation with group members, will decide on the frequency and venue of meetings. It is likely that meetings will be held within the local infected catchment.

2.3 The Local Stakeholder Group will probably comprise representatives of those organisations and groups, listed in Section 1.4.2 above, who operate in the infected area. Thus it will be appropriate for the local DSFB, local angling club, local distillery etc to be represented rather than their national bodies (Representatives of the local network office of VisitScotland/local tourist accommodation providers may also be included as there will be an ability to influence visitors via their hosts.)

2.4 It will be the responsibility of the Head of NDCC to decide on the composition of the Local Stakeholder Group but it is likely that in most circumstances it should contain representatives of the groups listed in 1.4 above. In order to achieve a focussed discussion the number of representatives from each organisation will be limited to two.

2.5 The Head of NDCC will decide on who should represent the NDCC.

3. **Other Delegates**

3.1 The Head of DSG and the Head of NDCC may co-opt other members to deal with specific issues as they arise.

Appendix 8 - Resources

1. Procurement of Accommodation, Stores and Equipment.

1.1 Scottish Government Procurement will be responsible for organising the purchasing and/or supply of additional accommodation and stores and equipment that will be necessary to deal with an outbreak of disease. Payments will be channelled through Marine Scotland budgets or such other budgets as DSG may arrange.

1.2 It is essential that Scottish Government Procurement are kept informed of any changes to this plan especially in regard to provision of accommodation etc as they are made. A member of Scottish Government Procurement should be dedicated to provide support to the Disease Strategy Group and be prepared to attend its meetings as required. This person will also be a key member of the team tasked with developing any eradication campaign.

1.3 Scottish Government Procurement can supply resources via immediate purchase, through framework agreements/call off contracts and, in slower time, via the advertising and tendering process.

1.4 To enable Scottish Government Procurement to respond effectively to requests for resources a list of likely requirements should be kept updated. It will also be useful to list sole suppliers against the request where such information is known. For the audit trail Scottish Government require justification for dispensing the competition and Scottish Government Procurement can advise on this matter. Current policy allows non-competitive action for work of exceptional urgency caused by unforeseeable circumstances where competitive tendering would cause unacceptable delays.

1.5 Scottish Government Procurement and other public sector bodies already have contracts in place for sourcing many of the routine requirements e.g.:

- Mobile phones
- IT
- Office furniture and supplies
- Utilities
- Interim staff
- Hotel booking agents
- Car Hire
- Travel management
- Project & property management
- Design and print
- Media

and it can respond very quickly to requests for such resources from the appropriate department. Staff should be aware that setting up of Local Disease Control Centres in remote locations may limit Scottish Government Procurement's ability to provide the quality required if, for example, local services are limited

1.6 It is normal practice to use competition procedures based on contracts and/or tendering to source supplies for Scottish Government and staff should normally follow these procedures. However, there are facilities for going outside normal practice to obtain emergency supplies when needed (see 1.4 above).

1.7 The Purchasing Officer at MSS has arrangements in place to source all the routine supplies needed for MSS staff to carry out their functions. However, if excessive amounts of equipment etc are required Scottish Government Procurement should be consulted and will be able to help. Scottish Government Procurement should also be consulted when additional accommodation is required for staff or laboratories at MSS. They will be able to source portacabins and furniture and equipment to fit them out if required. MSS may be in best position to source specialist laboratory equipment.

1.8 A list of resources required for dealing with an outbreak of *G. salaris* is provided in Annex 1 to this Appendix.

2. Overnight accommodation and refreshments

2.1 When developing containment and eradication plans consideration must be given to the numbers of staff that will need to be relocated to the area and how their accommodation and refreshment needs can be met.

2.2 Scottish Government Procurement can source accommodation in Edinburgh and elsewhere for any staff that may be brought in on secondment to assist either DSG or Marine Scotland. The Purchasing Officer at MSS should maintain a list of hotels that could provide accommodation, in the Aberdeen area, in an emergency. In both cases it would be desirable to arrange for B&B bills to be paid centrally on receipt of invoice from hotel. If this is not possible staff will reclaim expenses through normal channels.

2.3 Staff are normally expected to provide their own food during working hours BUT in emergency work this is not always practical and Head of NDCC will need to take responsibility for ensuring that these needs are catered for.

3. Security Issues

3.1 A large amount of routine and specialist equipment will be deployed during a campaign to deal with *G. salaris* and large amounts of sensitive and confidential papers and IT information will be collected. It is essential to ensure that tight security procedures are followed at all the locations involved.

3.2 The manager in charge of each unit must make arrangements to ensure that all buildings and contents are secured before premises are left unattended. If it is deemed to be necessary security firms may be employed to carry out this function. Any recommendation to employ security firms must be agreed with Head of DSG or NDCC as appropriate and Scottish Government Procurement asked to source a suitable firm.

3.3 Special care must be taken when using chemicals and local Health and Safety officers consulted on the level of security required.

3.4 Care must be exercised to ensure that visitors to any centre are accompanied or kept in public areas. Media briefing facilities should be placed, if possible, so that media personnel do not have unfettered access to operational areas. Any request from media personnel to access operational areas should be cleared with senior manager on site.

3.5 It is expected that normal procedures will be followed in permanent offices to ensure that security and back up protocols for IT are followed. In stand alone temporary centres the manager must make arrangements for these procedures or like ones agreed with ISIS (Appendix 2, Section 5 page 37), to be implemented.

3.6 In the event of suspected trouble from e.g. Animal Rights Groups the Police should be contacted.

4. Contractors

4.1 When a campaign is mounted to eradicate *G. salaris* from a catchment it will usually involve the building of barriers at points within the catchment. This work is outside the scope of Marine Scotland or MSS staff and will require contractors with specialist plant and machinery.

4.2 In planning a campaign, Scottish Government Procurement will need to be advised of the specifications for the barriers so that they can mount a tendering exercise. It would be prudent for Marine Scotland to appoint a Project Manager, with experience in this type of Civil Engineering work, to oversee the project. Scottish Government Procurement will be responsible for tendering this work and contacting suitable contractors who are able to supply plant and machinery.

5. Specialist skills

5.1 Management of Marine Scotland and MSS will identify staff with the specialist skills necessary to deal with an outbreak of *G. salaris* and ensure that their skills are kept up to date. They will also identify staff who have the ability to learn the extra skills required and ensure that they are given time to acquire such skills.

5.2 Management of SG and MSS will co-operate in providing training in the skills required either internally or by the use of trainers from abroad who have the experience and skills required. Consideration will be given to inviting suitable staff from the organisations listed in Appendix 2 to attend training/updating sessions to prepare them for their roles in dealing with an outbreak.

5.3 Consideration will be given to allow staff to gain skills in affected countries by means of short term secondments.

5.4 Resources will be made available both to test this plan and to update it on a regular basis.

6. Mapping

6.1 Maps will be required to delineate infected catchments, identify location of fish farms and wild fish populations and water transfer activities at the suspect/confirmed stage of an outbreak. Information on environmental and water parameters, geographical features and socio-economic aspects will be required when planning containment and/or eradication campaigns.

6.2 Data sets exist in various units from which maps can be produced. The responsibility for providing the information rest with MSS. A list of the various data sets and their location is contained in the Operations Manual at Appendix 11 (page 123).

7. Contact Lists

7.1 Each organisation involved in operating this plan will keep an up to date contact list which should also indicate which groups have to be informed of decisions/actions at each stage of an investigation/outbreak.

ANNEX 1 - CHEMICAL APPLICATION TO ERADICATE *Gyrodactylus salaris*

The purpose of this annex is to provide guidance on the equipment/services that will be required to treat with either rotenone and/or aluminium sulphate.

Information is provided in the following sections:-

A. Common requirements
B. Specific requirements for Rotenone application
C. Specific requirements for Aluminium sulphate application

A. Common Requirements

1. Local Disease Control Centre

(NB This relates to a stand alone centre)

1. 4 Portacabins—Office, Store, Laboratory & Mess Room
2. Office furniture
3. Office equipment
4. Telephone system (say 6 lines plus fax and IT connections)
5. Laptops
6. Laboratory benches and equipment
7. Tables and Chairs
8. Microwave, hot plate, kettles, pans, crockery and cutlery
9. Car park with washing and disinfection facilities.

2. **Shore Base**

1. Secure storage for chemicals
2. Means of decanting rotenone from 200 litre drums to 20 litre plastic containers
3 Simple workshop for assembly of drip stations, vehicle and boat maintenance
4 Reception for GS contaminated boats and vehicles
5 Field laboratory for dealing with fish mortalities
6 Clean vehicle parking
7 Under cover storage for boats and loose gear
8 Separate clean and dirty entrances
9 Shower facilities for staff
10**.** Two Portacabins for offices and one for a field laboratory plus an impervious standing for boats and vehicles would probably suffice provided the site was secure.
11.. Much larger storage facilities will be required to provide secure storage for vehicles and equipment.

3. Operator safety personal kit

1. Visors & Respirators

2. Rubber gloves
3. Wellington boots
4. All weather clothing
5. Life jackets
6. Torches
7. First aid kit in vehicles

4. Operators Communications Equipment

1. Hand held VHFs
2. Cellphones
3. (Essential equipment for coordination and calling for back up in case of equipment failure)

5. Tool boxes each including:

1. Adjustable spanners (2)
2. Medium size straight screw driver
3. Medium cross head screw driver
4. Small electrical test screw driver
5. Plug spanner for generator
6. Spare spark plug for generator
7. Ptfe thread tape
8. Junior hacksaw
9. Small half round file
10. Spare 240v 13amp fuses

6. Bioassay For Deep Pools

1. Floating cages for bioassay fish
2 Means of transporting test fish

7. Mortality Collection

1. Net to stretch across river
2. Rope
3. Fully equipped boat and crew as for deep pool spraying
4. Long handled landing nets
5. Plastic bags and plastic crates for mortalities
6. Shore support with pick up truck

8. Landing nets and personal kit for river bank walkers

1. All weather clothing
2. Life jackets
3. Wellington boots

4. Landing nets
5. Plastic bags
6. Data labels

9. Dirty Vehicle Reception At Shore Base

1. Hydraulic knapsack sprayers to apply Virkon or similar disinfectant to boats and vehicles
2. Wheel baths – ***bespoke trays*** with disinfectant soaked foam rubber
3. Fire hose with spray jet to wash Virkon off vehicles
4. Trestles / chequered tape to funnel dirty vehicles to reception area

10. Field Laboratory Data Collection Equipment

- **Operator's protective clothing**
    1. Disposable overalls
    2. Wellington boots
    3. Rubber gloves

- **Laboratory equipment** for each technician:
    1. Weighing machine - large spring balance or similar
    2. Bench
    3. Angle poise lamp
    4. Steel tape measure
    5. Measuring block for fish **- *bespoke***
    6. Wheelie bins
    7. Plastic crates for sorted fish
    8. Boning knife
    9. Recording sheets on clip board
    10. Pathology sampling equipment, scalpels, forceps, containers, labels etc.
    11. Brown craft paper to cover bench tops and measuring blocks
    12. Sticky tape

B. Specific Requirements for Rotenone Application

The listings below enable one to copy equipment developed by VESO and who have design rights.

11. Pumped application from shore – 200 litre "drip station"

1. Submersible Pump (Top 3 Pedrollo) http://www.pedrollo.co.uk/ped_top_desc.htm
2. Flow meter/regulator (Danfoss – now owned by Siemens)
3. ***Bespoke frame*** to hang flow meter/regulator on side of 200L drum 200 litre drum with end cut off

4. 1.6 KVA Portable generator set (Honda / Yamaha)
5. Spare generator as above
6. Four way extension lead for generator (generator powers submersible pump and flow meter/regulator)
7. 20 litre Petrol jerry can with filler spout
8. Lubrication oil for generator (4 stroke/2 stroke depending on set)
9. Bucket on a rope
10. Large measuring jug for rotenone concentrate
11. Plumbing accessories to make up drip station including:

    - 15mm stop cock
    - 0.5m x 15mm copper pipe
    - 15mm compression fittings - various
    - 15mm 90^0 elbow
    - 15mm hose pipe spigots
    - 10m x 15mm bore reinforced flexible hose
    - worm drive hose clips

12. **Pumped application from shore - Mid river booster station – equipment required plus two 200 litre pumped drip stations**

1. 200 metres of 12 mm steel wire rope
2. Tirfor hand winch (http://www.kk.org/cooltools/archives/000070.php)
3. Bulldog grips of appropriate size
4. Boat to get rope across river
5. 100 metres of 15 mm reinforced perforated flexible hose– ***bespoke component – calibration knowledge required***
6. 25 Shackles to slide on steel wire rope
7. 200 metres of fibre
8. Anchorage for Tirfor
9. 15 mm Y junction for hoses

13. 200 Litre gravity feed drip station

1. Intact 200 Litre drum with key for bung
2. Wooden trestle **- *bespoke***
3. Either prior calibration or measuring cylinder and stop watch to calibrate
4. Short length of 15 mm flexible hose to direct out flow
5. Worm drive hose clip

14. 20 Litre gravity feed drip station

1. 20 Litre plastic container with screw top , threaded spigot for tap and tap
2. Either prior calibration or measuring cylinder and stop watch to calibrate.

15. Rotenone Application By Boat

- **Operator's personal kit – 2 sets per boat**

1. Waders
2. Life jacket
3. Canoeists hard hat
4. Gloves
5. Torch

- **Crew's communications equipment**

1. Water proof hand held VHF radio
2. Cellphone

- **Boat and its gear**

1. Polythene RIB e.g. Steady 260 http://www.boat.no/asp/boats/show.asp?id=17044
   (In Scotland Fusion Marine make a suitable equivalent.)
2. Towing pick up truck with road trailer
3. Oars & rowlocks
4. Anchor & warp
5. Painter
6. Mooring warp also used for shore control when under weigh
7. Bailer/bilge pump

(Gael Force supplier to much of the Scottish fish farming industry is one possible source for boat gear.)

- **Application equipment**

1. 2 stroke pump
2. 5 Litre petrol containers – 2 stroke oil ready mixed.
3. Rotenone concentrate tank
4. Rotenone tank to pump connection and means of regulation.
5. Length of fire hose
6. Fire hose spray nozzle
7. Worm drive hose clips

- **Shore support**

1. Tools – plug spanner
2. Medium straight screw driver
3. Cross head screw driver
4. Spare spark plug
5. Spare pump ready to work
6. Large measuring jug for rotenone

16. Micro Scale Rotenone Application Equipment For Small Seeps

1. Hydraulic knapsack sprayer (Hardi or similar)
2. Bucket on a rope for filling sprayer
3. Watering can

C. Specific requirements for Aluminium sulphate (AlS) application

17. Background to using AlS

1. The preferred strategy is to dose from one main station high up the river and then to operate several top up stations downstream to maintain appropriate levels of acidity and aluminium. The aim of the strategy is to reduce the alkalinity of the water, to produce target levels for pH and aluminium and to maintain target concentrations. Dosing is controlled by monitoring the pH of the water upstream and downstream of dosing stations, with feedback to the controller. On site measurement of labile aluminium is carried out but not in real time.

2. The method used involves using 96% sulphuric acid at the uppermost dosing station on most rivers and then to use 30% acid at top up stations. In small rivers 30% acid is used at the uppermost station, even if the alkalinity is high. In very large rivers with low alkalinity will still use 96% acid to reduce the amount of chemical to be transported, stored and used.

3. The ultimate aim of the strategy is to produce pH levels and aluminium concentrations, at all acceptable water flows that wipe out the parasite but have no serious effects on the salmon. At high water levels the volume of chemicals required are too high while at low levels pools in the river bed and seeps may not be affected by the treatment.

4. AlS cannot be used exclusively because:-
    a. Control with AlS relies on measurable flow rates for accurate dosing and water flow for the mixing necessary for a homogeneous treatment.
    b. In small seeps and heavily vegetated areas it is not possible to maintain AlS concentrations within acceptable limits, hence the need to use rotenone in these difficult areas. In practice local overdosing of small marshy areas with rotenone is carried out so as to be assured of 100% fish kill. There is no significant environmental burden as the rotenone is rapidly degraded.
    c. It cannot legally be used as a piscicide
    d. Its use is very resource intensive and poses Health and Safety concerns.

5. Treatment with AlS will normally involve treating some areas with rotenone.

18. Main Dosing Stations

1. Good road access for vehicle weighing up to 55 tonnes.
2. At least one tank of 26,000 litres of 96% concentrated sulphuric acid
3. One 20 foot general purpose container equipped with dosing and measuring equipment (Details to be provided by Norwegian Institute of Water Research)
4. 4-5 containers (30 tonnes capacity each) capable of storing and dispensing aluminium sulphate
5. Container steel to contain Corten (an alloy which forms a protective scale as steel corrodes) and coated internally with an epoxy paint to reduce deleterious effects of acid vapours
6. Polypropylene rope on which to suspend pipes across river
7. Flexible hoses through which to dispense sulphuric acid and aluminium sulphate with selection of variable sized nozzles to ensure even distribution across full width of river—also need collection of angle and straight connectors from tanks to hose together with metered pumps
8. Weld Mesh secure fencing to isolate site—all containers to be locked when unattended
9. Provision for security staff
10. Staff mess facilities including easily accessed showers for emergency use in event of an acid spillage
11. Health and safety risk assessments and notices displayed in prominent positions
12. Floating sensors to monitor pH downstream and connected to equipment to automatically adjust flow rates to achieve desired pH range
13. Fish cages below treatment point to monitor for toxicity (NB Home Office licence maybe needed)

19. Top Up Dosing Stations

1. Top up dosing stations will usually be smaller than main stations and hence amount of equipment required will be less but size of tanks and containers maybe similar.
2. Will always need at least one tank for sulphuric acid and one for AlS but sizes will vary both due to size of top up required and also ease of access.
3. Small top up dosing stations may require no more than a one tonne container for AlS and a similar size tank of 30% sulphuric acid
4. With the above provisos top up dosing stations require most of the provisions of Main dosing stations.

20. Health and Safety Issues

1. Transport and usage of concentrated sulphuric acid poses particular problems in terms of Health and Safety both for transporters and users.
2. The transport of sulphuric acid is governed by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004. The legislation can be found at http://www.opsi.gov.uk/si/si2004/20040568.htm and advice from the Health and Safety Executive can be found at http://www.hse.gov.uk/cdg/index.htm . Contractors employed

to transport sulphuric acid in support of actions in this plan must be fully conversant with these regulations and advice. Officials should consult these sites when drawing up transport protocols for sulphuric acid.

3. The Health and Safety aspects of using acids is governed by the Control of Substances Hazardous to Health Regulations 2002 (COSHH). Any supplier of acid should be asked to provide the relevant COSHH data sheet and a risk assessment can then be prepared by following instructions at http://www.coshh.essentials.org.uk . Information on the risk associated with sulphuric acid can be found on the Health Protection Agency web site at http://www.hpa.org.uk/chemicals/compendium/sulphuric_acid/default.htm .
4. Personal Protective Equipment (PPE) will be provided to all workers working with acid. This will include:-
    - Eye Protection
    - Chemical suits
    - Nitrite gloves
    - Wellington boots

    In addition emergency showers will be provided for use if acid is spilt.

NB Staff must NOT be allowed to work with sulphuric acid until a risk assessment has been drawn up, they have read it and signed that they have both read and understood the contents.

Whenever contractors are employed they must comply with all relevant Health & Safety legislation and ensure that their own staff and any sub contractors that they employ are fully conversant with their own responsibilities and have received proper training therein.

The Head of DSG and the Head of NDCC must ensure that that Scottish Government are legally covered in the event of an operator accident.

Appendix 9 - Gene Banking and Restoration

1. The aim of this appendix is to set out guidelines to be followed when populations of salmon are depleted either through an outbreak of *G. salaris* or the treatment of a catchment that destroys the salmon stocks or through a combination of both. The assumptions used in preparing this appendix are detailed in Annex 1 (page 118).

2. Gene banking, as an aid to restoration, will be required in situations when the plan is for the parasite to be eradicated by the use of rotenone. Gene banking may also need to be considered when rotenone is used in conjunction with aluminium sulphate or when containment only is practised as both methods are likely to deplete salmon stocks.

3. In such situations the management aim will be to restore populations of a range of genetic sub groups of salmon in existence prior to the *G. salaris* outbreak. The need for the restoration and gene banking of other species will be assessed based on the genetic make up of the species and whether or not similar populations exist in other Scottish waters. If all the individuals of a species in Scotland are of similar genetic make up they can be replaced from other rivers without the need for gene banking. If SACs are in place for specific species e.g. freshwater pearl mussels, consideration will need to be given to a restoration programme involving gene banking.

4. Restoration

4.1 The restoration objective will be to re-establish healthy, self-sustaining native populations of salmon and species covered by para 3 above to a river system that is recovering from an outbreak of *G. salaris*.

4.2 The requirements to restore *G. salaris* infested rivers will be determined by:

The method and time scale required for eradication.
The number of species and genetic populations impacted; the latter will vary with location, the physical nature of a river and its size.

5. Gene Banking

5.1 The aim of gene banking is to support the restoration of healthy, self-sustaining populations of native fish in affected river systems. See Annex 2 (page 120) for schematic plan of gene banking.

5.2 Where eradication is attempted, gene banking operations will aim to conserve inter- and intra-specific fish diversity and provide ova/fish to re-establish native populations. The use of rotenone may require the gene banking of all affected populations of native fish species in the treated river system; this may not be necessary in the case of migratory species if eradication can be achieved quickly whilst most of the adults are at sea and the populations can be naturally restored by returning migratory adults.

5.3 Gene banking will be necessary when barriers are used in eradication programmes given the eradication time frame will be a minimum of 3-4 years to ensure all salmon and residual *G. salaris* on other fish species have been eliminated.

5.4 Gene banking needs may be minimal if aluminium sulphate treatment is used, as populations are not eliminated. However some gene banking may be useful to protect biodiversity in depleted Atlantic salmon populations and support a more rapid restoration of populations to a healthy, self-sustaining state.

6. **Treatment Methods**

6.1 Exclusion Barriers for Atlantic salmon

6.1.1 Barriers can be used alone if they can be installed at the head of tide so that there is no salmon habitat downstream. Barriers may have to be in place for periods of 2-4 years to ensure that all juvenile salmon have migrated out of system and there are no remaining *G. salaris* on temporary hosts such as brown trout, rainbow trout and Arctic charr.

6.1.2 The impact on resident fish and invertebrate species, where barriers are placed at the head of tide, are likely in most cases to be temporary and restricted to area immediately upstream of barrier. The main impact will be on migratory fish populations including Atlantic salmon, sea trout (*Salmo trutta*), eels (*Anguilla anguilla*), lamprey (*Petromyzon marinus, Lampetra fluviatilis*), shad (*Alosa fallax*), and sparling (*Osmerus eperlanus*).

6.1.3 Gene banking will be required for Atlantic salmon, sea trout and other migratory species such as shad and lamprey in river systems where these species occur. Depleted eel stocks may be able to be restored by transfer of eel elvers from adjacent river systems as eels in all Scottish river systems are likely to belong to the same genetic population.

6.2 Rotenone

6.2.1 Gene banking will be required for all resident fish populations if this is deemed necessary under the Water Framework Directive or the Habitats Directive and for salmon especially if populations are depleted and there is likely to be limited numbers of adults returning from the sea.

6.2.2 Gene banking of sea trout may be required where treatment occurs over a number of years and natural restoration by returning or straying adults is absent or limited.

6.2.3 Gene banking of other migratory species such as shad and sparling may be needed if rotenone treatment has an adverse effect on these species in the river systems where they occur

6.2.4 The use of rotenone in combination with upstream exclusion barriers may reduce the impact on resident fish communities, speed up recovery of invertebrate communities on which fish depend, and reduce gene banking needs. There may, however, still be significant impacts

from upstream barriers on populations of freshwater resident fish, including brown trout and Arctic charr (*Salvelinus alpinus*).

6.3 Aluminium sulphate

6.3.1 Aluminium sulphate has little or no impact on fish and invertebrate populations when used in pH range 5.9 to 6.5 but can be toxic outside this range.

6.3.2 Limited short-term gene banking of affected native Atlantic salmon stocks may be desirable to provide material for supplemental stocking to speed up stock recovery. It may also be advisable to gene bank freshwater pearl mussel and other important threatened aquatic species within a SAC.

7. Operational Issues for Restoration

7.1 DSFBs have powers to restore salmon stocks but are under no legal obligation to do so. There is no defined responsibility for restoration work on other fish species. In the absence of legally defined responsibilities it will be for Scottish Ministers to decide who should take the lead in dealing with restoration and who will pay for the cost of restoration work.

7.2 Local restoration committees should be set up to oversee restoration work and link with the gene banking programmes. These committees will be set up after local consultation and could include representatives from the local proprietors, Trusts and DSFBs as well as SNH, SEPA and Scottish Government. Marine Scotland Science (MSS) may be best placed to oversee the gene banking programme.

7.3 Restoration work is likely to take several years before it is completed. The Scottish Government will implement regular reviews with the local restoration committees to ensure that plans are sound and delivering the benefits expected.

7.4 Scientific Expertise for salmon and sea trout restoration currently exists within MSS, DSFBs, Trusts, and the farming industry, and will need to be drawn upon in developing and auditing restoration plans. Expertise in the restoration of some other fish species exists in other UK agencies and should be utilised.

8. Operational Issues for Gene Banking

8.1 To protect biodiversity, gene banks should:-

- Be stocked with wild caught adults screened to avoid using non native fish
- Genetically screen any juvenile fish used to ensure that they derive from a large number of different wild families;
- Maximize number of adults/families used but, where possible, use at least 25 males and 25 females;
- Be based on equal numbers of males and females in each gene bank family;

- Cryo-preserve sperm from additional males for use in the production of ova/fish for restocking;
- Minimize number of generations and mortalities in the gene bank to avoid random intergeneration loses of genetic diversity;
- Consider gene banking the species most under pressure first especially if facilities are limited.
- Implement a rigorous disease control policy to minimise mortalities;
- Reduce generational changes by using kelt reconditioning and repeat spawning; and
- Use low energy specialised diets to extend generation times and increase the time frame of repeat spawning.

8.2 To avoid disease, gene banks should:-

- Be established in locations with high volumes of high quality freshwater sources devoid of migratory fish stocks and with only limited resident fish stocks e.g. using water from upland, oligotrophic lakes or reservoirs;
- Be maintained entirely in freshwater;
- Be established using eggs from crosses derived from disease free fish; this can be achieved by keeping eggs from wild fish in quarantine while fish are tested for disease; and
- Adopt a rigorous disease exclusion regime within the gene bank facility.

8.3 Gene banking should involve the use of central facilities to allow diversity and disease to be most effectively controlled, and to keep costs down. The cost of gene banking additional stocks in a facility is marginal compared to the basic set-up and running costs. The risks associated with a central facility will be small and acceptable if proper disease control and husbandry are practiced.

8.4 The numbers of brood fish needed to maintain biodiversity may be relatively small but the numbers of brood fish kept in gene banks may need to be much larger to meet the needs of the restoration programme. This will require advanced co-ordinated planning given that it may take up to 4-5 years to produce additional brood fish.

8.5 The risk of mechanical failure or the introduction of disease into a gene bank must be considered when planning facilities. A minimum of two gene banks will be required to provide a contingency against failure for whatever reason.

9. **Organisational issues**

9.1 Responsibility for restoration for fish species is not defined in law though organisations such as SEPA and SNH will, through the EU Habitats and Water Framework Directives, and other national legislation have interests as will proprietors.

9.2 Legislation does not define who would pay for gene banking and Scottish Ministers will need to make a decision on this issue before gene banking can be commenced.

9.3 The rigorous requirements for disease control and a specialised low-density rearing environment mean that many locations currently used for hatcheries and smolt rearing would not be suitable for gene banks. A review of suitable sites and existing facilities for setting up centralised gene bank facilities should be carried out in advance so that these sites can be targeted immediately for development if the need arises.

9.4 Current legislative requirements are unlikely to present an obstacle to establishment of gene banks e.g. setting up gene banks will require discharge consents from SEPA. SGLD advice will be obtained in advance of setting up a gene banking programme.

Appendix 9

Annex 1- Background Assumptions to Gene Banking and Restoration

- Scottish Atlantic salmon (*Salmo salar*) populations are highly susceptible to *G. salaris*. The presence of *G. salaris* will result in the extinction of up to 98% Atlantic salmon in populations in infected river systems.

- The eradication of *G. salaris* from infected river systems is the preferred option. Norwegian experience shows that success in the eradication of *G. salaris* is reasonably high, at least, in small, simply structured systems.

- Current approaches to eradication are based on elimination of Atlantic salmon from infected rivers using rotenone, or rotenone in combination with barriers to the return of migratory adult salmon. The use of rotenone and barriers will lead to the loss of native Atlantic salmon populations, and potentially to populations of other migratory and freshwater fish species, and will severely impact invertebrate faunas.

- The rapid restoration of sustainable native fish populations post-eradication will depend on natural re-colonisation and/or the reintroduction of locally adapted native fish.

- Natural re-colonisation is likely to be limited and a slow way back to healthy sustainable fish populations in most cases, when management time frames are considered.

- Reintroduction of native populations of Atlantic salmon and other impacted species such as freshwater pearl mussels (*Margaritifera margaritifera*) will require their protection in living gene banks.

- Aluminium sulphate treatment, currently being trialled, may offer an alternative and would be preferred as it does not require elimination of Atlantic salmon and does not appear to severely impact on native populations of freshwater species.

- If eradication is not possible, the potential management options available are:

1. Do nothing and accept the impact on the native salmon and other fish and invertebrate populations. A particular concern in this respect in many river systems will be the loss of pearl mussel populations which are parasitically dependent on the Atlantic salmon.

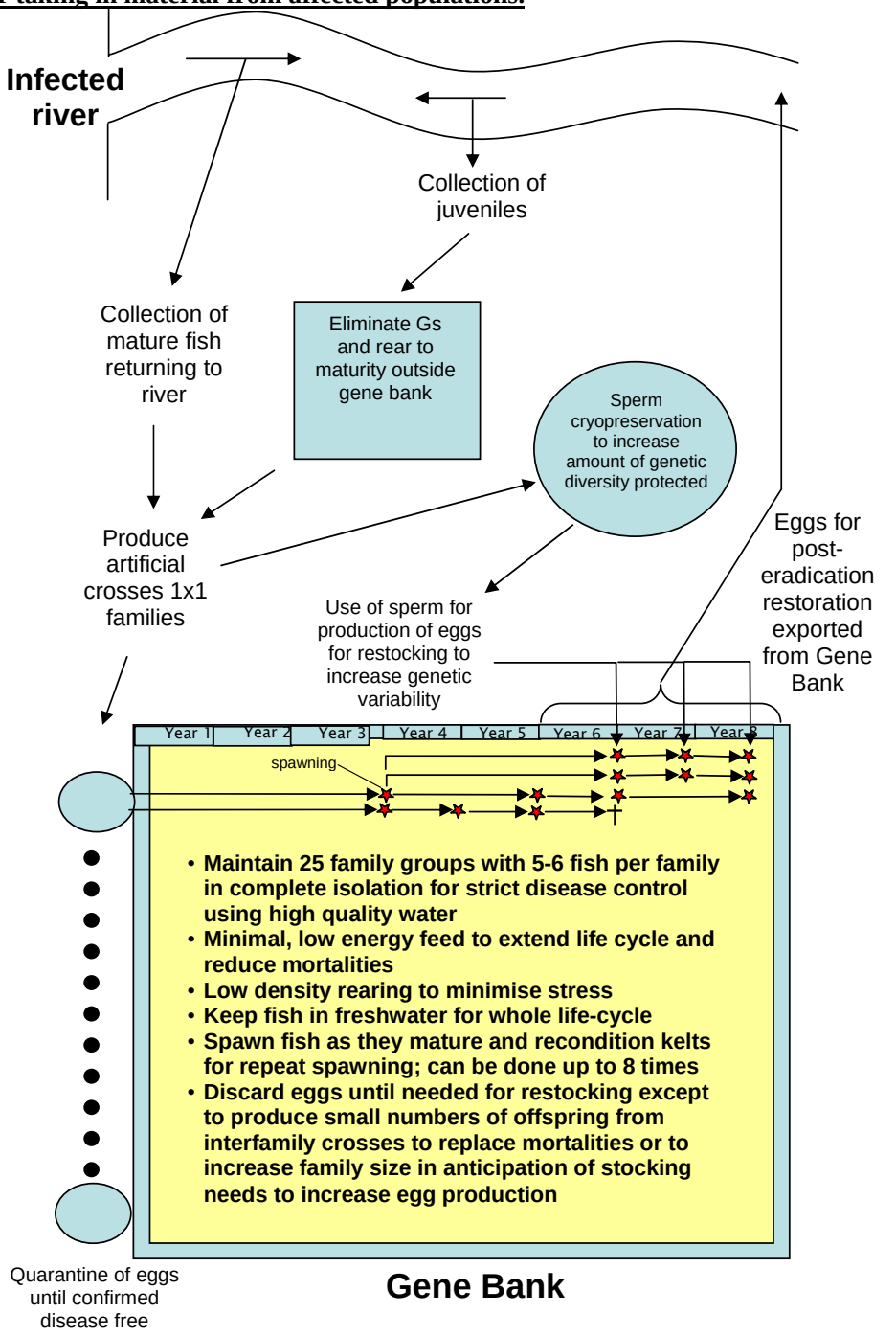
2. Gene bank native populations and develop a supportive breeding programme to introduce heritable resistance into the native, locally adapted populations.

3. Carry out supplemental stocking of infected river with a resistant, non-native Atlantic salmon aimed at evolving new locally adapted resistant populations in the long-term.

- Current options for dealing with a *G. salaris* impact will threaten the survival of native populations of Atlantic salmon, and potentially other species, and programmes for restoring healthy, sustainable native populations will be needed.

- Restoration aims can only be realistically achieved by setting up gene banks of native populations and these need to be an integral part of the management response to *G. salaris* infestations of Scottish rivers

Appendix 9, Annex 2 - Schematic Plan of Key Elements of Gene Banking Process showing two options for taking in material from affected populations.



Appendix 10 - Plans or Projects – Competent Authority Issue of Consent or Permission

Requirements of the EC Habitats and Birds Directives and the associated Conservation (Natural Habitats, &c.) Regulations 1994

1. When giving consideration to the issue of any consent or permission associated with a plan or project all competent authorities must first determine whether the plan is necessary for the conservation management of the site and if not then determine whether the proposed consent/permission (either alone or in conjunction with other plans or projects) is likely to have a significant effect on a European site,.

2. If the competent authority is not able to determine that there would not be a likely significant effect then an appropriate assessment must be undertaken by that authority. This assessment must be made in view of the site's conservation objectives. It is usual for the competent authority to request any necessary information from the applicant. The competent authority shall for the purposes of assessment consult the appropriate nature conservation body – Scottish Natural Heritage. On request, SNH may provide guidance on what the appropriate assessment should encompass. At this stage the competent authority may also choose to seek the opinion of the general public.

3. If the appropriate assessment is unable to determine that the plan will not adversely affect the integrity of a Natura site then the competent authority can only approve the plan if two further tests are met. The first is that it must be demonstrated that there are no alternatives that would allow the plan/project to take place without, or with less, damage to the Natura interests.

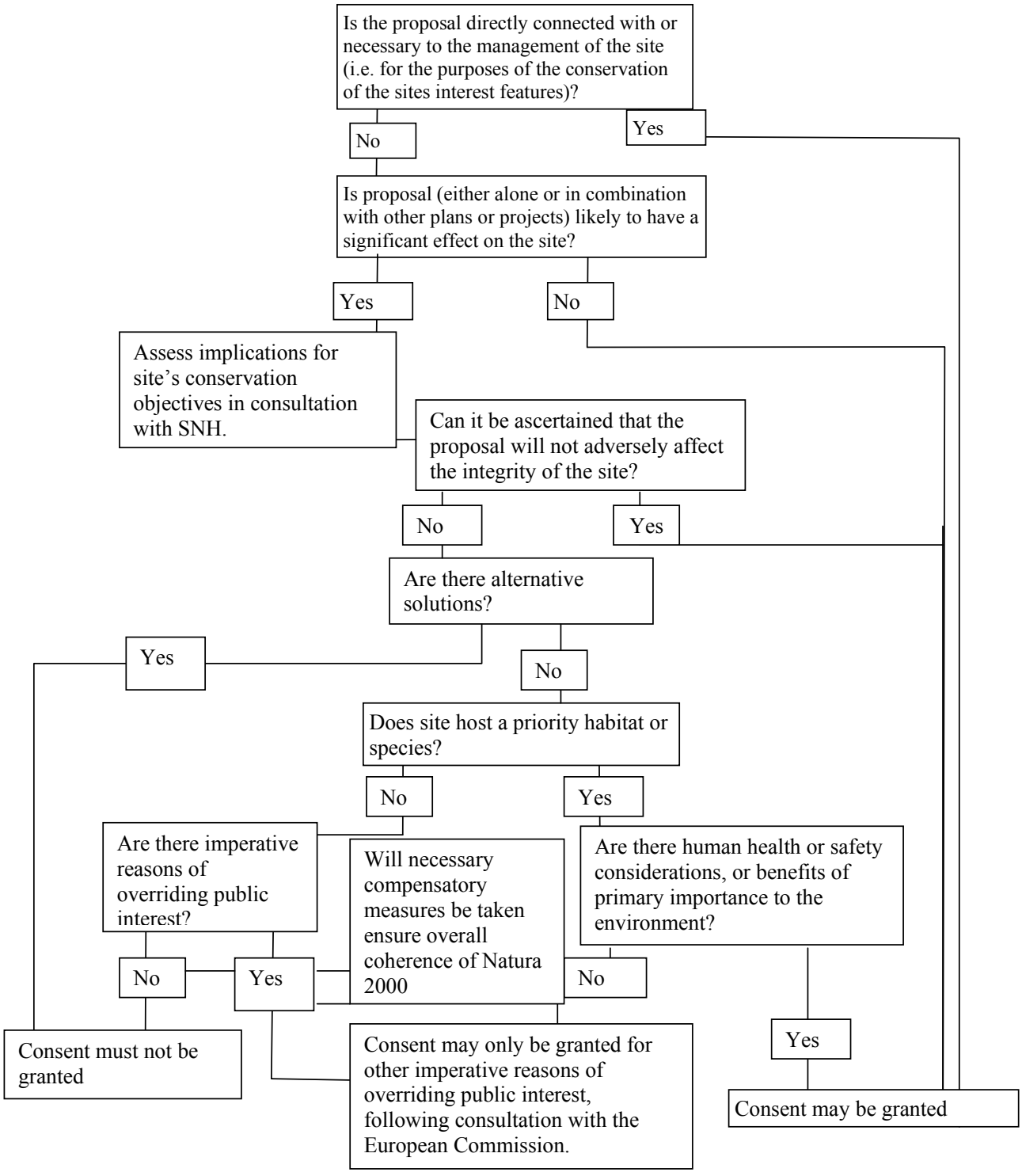
4. If there is no alternative then the competent authority must then consider whether there are imperative reasons of overriding public interest that warrant consent for the plan/project to take place. These can be of a social or economic nature, except where a site has been designated for a European priority habitat or species. If a priority interest is involved, then consent cannot be legally issued unless the plan/project is overriding for reasons such as public health or safety, or for other reasons that the European Commission consider justified (written request necessary).

5. If all of the above can be justified, and the consent is to be issued, with resulting damaging effects on Natura interests, then the Member State must ensure that compensatory measures are taken to ensure the overall coherence of the Natura network is protected. This may consist of recreating habitat on a new or enlarged site to be incorporated into the Natura network, improving non-qualifying habitat on part of the site or another Natura site proportional to the loss due to the plan/project, or in exceptional cases, proposing a new site for designation.

More detailed European Commission Guidance on the requirements of Article 6 of the Habitats Directive (this applies equally to the Birds Directive) can be found at:
http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf

Scottish Government Guidance on the Habitats and Birds Directives can be found at:
http://www.scotland.gov.uk/library3/nature/habd-00.asp

CONSENTS AFFECTING SPAs AND SACs



Appendix 11- Operations Manual

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Annex 7. List of SOPs cited within the Operations Manual

Flow chart 1. Overview of procedures in relation to suspicion and confirmation of *G. salaris*
Flow chart 2. Placing movement restrictions on suspect sites
Flow chart 3. Procedures for sampling sites
Flow chart 4. Epizootic investigations – Overview
Flow chart 4a.Epizootic investigations – Live fish movements
Flow chart 4b. Epizootic investigations – Other risks
Flow chart 5. Eradication

1. Introduction - Aim of the Operations Manual

1.1 **This Operations Manual will function as part of the *Gyrodactylus salaris* Contingency Plan and it forms Appendix 11 of that document.**

1.2 The continental waters of Great Britain are classified as a disease free zone with respect to *Gyrodactylus salaris*. National measures are approved through Commission Decision 2010/221/EU which limit the impact of Gs in aquaculture and wild aquatic animals in the UK. These measures have been introduced under article 43 of Council Directive 2006/88/EC offering provisions for limiting the impact of diseases not listed within that Directive. Protective measures against trade in infected fish are granted dependent upon a programme of control and eradication in relation to any outbreaks of Gs.

1.3 This Operations Manual (hereafter referred to as 'the manual') has been drawn up by Marine Scotland Science (MSS), part of the Marine Scotland Group within Scottish Government. It is designed to deal with the detection of the freshwater parasite *Gyrodactylus salaris* infecting wild or farmed fish species within the waters of Scotland. This manual is the field and office operations guide directed at the actions of the National Disease Control Centre (NDCC) and staff at MSS. The manual will:-

- Form the core instruction to MSS staff on how to deal with suspicion and/or confirmation of the disease within Scotland;
- Highlight the necessary actions to be taken in relation to containment and eradication;
- Provide instruction on diagnosis and epizootic investigation; and
- Define the roles and responsibilities of the key players at MSS who will be involved in making decisions in relation to both the control and eradication of the disease.

1.4 These instructions are essential to help both permanent and temporary staff members function efficiently in the event of an outbreak.

1.5 The actions detailed in the manual incorporate a number of Standard Operating Procedures (SOPs) which give detailed operational instructions. All SOPs referred to within the manual are held at MSS.

1.6 The policy is to be based upon a strategy of eradication. However, it has been identified that this may not always be achievable. In such circumstances, a strategy of containment will prevail.

1.7 The Aquatic Animal Health (Scotland) Regulations 2009 is the underpinning piece of legislation for the manual. Reference must also be made to Appendix 1 of the Contingency Plan (hereafter referred to as 'the plan') which identifies other pieces of legislation that are important to operations.

1.8 This manual is a 'working document' and will require annual, or if necessary more frequent, review. It will be subject to change, as necessary, following the implementation of new legislation and scientific advances in relation to *G. salaris*, its control, diagnosis and eradication.

2. Suspicion and Confirmation of *Gyrodactylus salaris*

2.1 Sections 2.15 to 2.27 of the plan refer to suspicion and confirmation of *G. salaris* and should be referenced in relation to this section.

The origins of suspicion

2.2 The suspicion of *G. salaris* may arise from a number of sources. The origin of suspicion will determine how to proceed with containment, sampling and epizootic investigations. Flowchart 1(See P 171). identifies some of the possible routes by which suspicion may arise.

2.3 Initially *G. salaris* may not be immediately obvious but suspicion may result following:

1) Routine inspection and sampling or general diagnostic testing of freshwater salmonids, preceding laboratory analysis and the identification of gyrodactylids.

In this instance we may advance quickly to confirmation through laboratory analysis. However, this situation may be a result of gyrodactylids other than *G. salaris*;

2) Unexplained mortality or sudden loss of freshwater Atlantic salmon juvenile populations and the absence of juveniles in an area where they were previously present.

This may be related to many other disease pathogens, environmental or recruitment factors (such as the number of returning adults, food availability and increased predation pressure) which can influence the population size.

2.4 The above situations would result in routine diagnostic sampling with a view to screening for all notifiable disease pathogens (including *G. salaris*). In addition, fish may be sampled for other pathogens and histopathology would normally be carried out on fixed material. The presence of gyrodactylids may then give rise to official suspicion of *G. salaris*, if for example this was associated with mortality within an Atlantic salmon population. The identification of *G. salaris* would give grounds for confirmation.

2.5 Initial suspicion may also be obtained prior to a site visit or inspection by any of the following means:

3) Reported mortality with the presence of gyrodactylids;

4) A claim of mortality being attributed to *G. salaris* (the source of the claim may influence our immediate actions);

5) The legal or illegal introduction of fish from a farm, zone or country infected with *G. salaris*.

2.6 Instances 3, 4 and 5 may give an initial suspicion prior to sampling. The level of suspicion will be assessed by the National Disease Control Centre (NDCC) the role of which is described within section 3.5 of the plan.

2.7 As soon as sufficient evidence for official suspicion has been obtained, measures will be taken to implement a programme of containment. This will involve the enforcement of movement restrictions upon the grounds that the suspect sites or locations may become infected with *G. salaris*; a sampling and surveillance programme to determine the presence and distribution of *G. salaris*; and an epizootic investigation to attempt to ascertain the origin of infection and the extent of disease and pathogen spread. These actions are covered within further sections of this manual; Section 4 – Movement Restrictions; Section 5 – Field Investigations; Section 6 Epizootic Investigation.

2.8 In addition to the containment procedures, the option of eradication will also be considered throughout the containment period. Appendix 3 (See P48)of the plan examines the criteria for making this decision. Section 8 (See P144) of the manual highlights some of the operational procedures involved.

2.9 Flow chart 1 (See P171) details the main scenarios that could amount to suspicion and confirmation and actions to be taken from this point.

Actions upon suspicion and confirmation

2.10 Paragraphs 2.11 to 2.17 below, give an outlined overview of the procedures to be adopted in the case of suspicion and confirmation of *G. salaris*. These responses are represented in Flow chart 1.

Suspicion

2.11 If it is considered that there are reasonable grounds for suspicion then the following actions will be implemented:

1) Service of an Initial Designation Notice on the suspect farm/catchment

2) A National Standstill may be enforced under powers of the Aquatic Animal Health (Scotland) Regulations 2009. The decision to issue movement restrictions will be the responsibility of Marine Scotland. The decision regarding the extent to which movement restrictions will be placed will be decided by DSG with scientific advice from NDCC The application of movement restrictions will be the responsibility of the Fish Health Inspectorate (FHI) at MSS. Section 4 of the manual details this procedure;

3) Establish the Disease Strategy Group (DSG) and the NDCC;

4) DSG will inform relevant bodies or parties; (See P??)

5) MSS will undertake diagnostic investigation and statutory sampling at the suspect location(s). Section 5 of the manual details this procedure;

6) MSS will commence an epizootic investigation. Section 6 of the manual details this procedure (See P139).

2.12 The results from diagnostic investigations and statutory sampling will determine the next step in relation to the suspected case.

2.13 If a negative result is obtained then further testing and investigation may be considered. Suspicion may be ruled out. If so, movement restrictions will be withdrawn. This will be a decision made by the DSG with advice from the NDCC.

Confirmation

2.14 If a positive result is obtained then the following actions will be completed.

1) Service of Confirmed Designation Notice on positive farms/catchments and buffer catchments

2) Send material to OIE for corroboration (in case of first positive).

3 Establish DSG and NDCC (if not done so already).

4) Continue with or commence an epizootic investigation. The epizootic investigation will advise on the decision to contain or eradicate the parasite

5) Inform all necessary government agencies and other stakeholders at a meeting at MSS, organised by the head of the NDCC, where stakeholders are unavailable to attend either the meeting or via video/telephone conferencing, an update will be given in writing, the template draft at Appendix 5 Annex 4 could be adopted for this purpose (see P81)

6) Issue a press release confirming the presence of *G. salaris*; (See P86)

7) Maintain containment measures, including adequate education, regular meetings and disinfection stations.

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2.15 Depending upon the location under suspicion or confirmation, and the results of the initial epizootic investigation, movement restrictions may need to be applied in other parts of the UK. In such a situation, close communication with the Fish Health Inspectorate at Cefas (Centre for environment, fisheries and aquaculture science) and the Department of Agriculture and Rural Development in Northern Ireland (DARDNI) will be necessary. There may also be implications

for other countries which have received live fish and/or eggs of fish from Scotland. These international obligations will be dealt with by Marine Scotland and Defra.

2.16 Section 1.20 of the plan identifies the requirement for a cross border response should an outbreak of *G. salaris* be associated with any part of the River Tweed or Border Esk catchments.(See P3)

3. **Structure, Organisation and Communication**

3.1 The strategic management of the disease will be undertaken by the Disease Strategy Group (DSG) assisted by the National Disease Control Centre (NDCC) which will provide tactical and operational management. The Expert Group on *G. salaris* will provide an advisory function in relation to scientific research and development into the parasite and the disease. This will be beneficial to the development of the plan and the policy, along with the operation employed in dealing with an outbreak.

The Disease Strategy Group (DSG)

3.2 The DSG will be responsible for the overall control of the outbreak in Scotland. Details of its role are defined within section 3.3 of the plan. (See P13)

3.3 One member of the DSG will be responsible for liaising directly with the head of the NDCC on both field and policy issues.

The National Disease Control Centre (NDCC)

3.4 The NDCC will be established immediately following official suspicion and will be based at MSS. The role of this group is defined within section 3.5 of the plan. (See P14)

3.5 An MSS management structure will be adopted to form the nucleus of a management structure for the NDCC and will operate as follows:-

- The head of the NDCC will be the Director of the Aquaculture and Fish Health Science (AFHS) Programme of the MSS. He or she will consult with other members of the Management Board as necessary;

- The NDCC will include relevant Group Leaders, or their representatives, from the AFHS Programme and other MSS Programmes as necessary;

- Other MSS staff may be co-opted onto the NDCC as required. This may include the Head of MSS or other relevant senior staff as considered necessary.

3.6 The exact composition of the NDCC will be determined by the head of NDCC. A suggested structure of the NDCC, with associated staff, is detailed in Annex 1 of the manual.

The Local Disease Control Centre (LDCC)

3.7 The NDCC, in consultation with the DSG, may consider the establishment of Local Disease Control Centres (LDCCs). These will be under the control of the NDCC and will be located remotely from MSS.

3.8 Remote locations may present logistical issues associated with sampling, surveillance and eradication programmes. The establishment of LDCCs will depend upon the geographical location of the outbreak(s) and consideration of the logistical and financial implications of running such a unit(s), compared to the regular travel to and from the area for sampling and surveillance. Enlarged LDCCs will be necessary where eradication is undertaken. Help may be obtained from the SCG in sourcing supplies and in establishing the LDCC.

3.9 It is perceived that the administrative functions of the LDCC will be limited. These units will act as sampling, inspection and eradication bases. One person (a Senior Fish Health Inspector or Area Manager) will be responsible for running the office and disseminating information passed on from the NDCC to field staff as necessary.

3.10 Each LDCC will maintain a detailed map of the catchment(s) under surveillance for *G. salaris*. This map will identify all fish farm sites and put-and-take fisheries as well as the location of privately owned ponds and fish holding facilities. It will contain summarised data in relation to disease testing and disease status. There will be information detailing natural and man-made barriers, water extraction points and potential problem areas in terms of sampling or eradication e.g. – large expanses of open water. A similar map, detailing treatment points, will be required when carrying out eradication procedures.

3.11 Establishment of the LDCC should be conducted in accordance with the guidance provided in Annex 3 of the manual. (See P159)

Communications internal and external

3.12 Appendix 5 of the plan details the strategy to be adopted and the issues to be addressed in relation to communication. Within the NDCC, an internal communications chain or information flow must be established. It will be necessary to ensure that regular meetings are held to aid a focused, efficient sampling and surveillance programme. The frequency of meetings will be determined by the head of the NDCC and will be dependent upon the location, distribution and evolution of a suspected or confirmed outbreak.

3.13 Initially, meetings of the NDCC should be held daily. Subsequently the head of the NDCC will decide on the frequency of meetings depending on the issues to be managed. Video conferencing facilities can be used to facilitate meetings between the NDCC and the DSG.

3.14 It will be the responsibility of all members of the NDCC to disseminate information to the Group level and to receive reports back from their staff and notify the NDCC as necessary.

3.15 All staff members have the responsibility to report any findings or additional information, to their Group Leader, which could impact on the response in relation to an outbreak of *G. salaris*. Group Leaders will be responsible for communicating such information to the head of NDCC.

3.16 Communication links within the NDCC and between the NDCC and the DSG are represented within Annex 1 of the manual. This also highlights the potential internal staff movements within AFHS. The communications co-ordinator based at the DSG will liaise with the NDCC to ensure effective communication throughout.

Wall and floor plans

3.17 A wall plan, comprising of Flowcharts 1-5 (See P171-179), will be drafted showing the procedures to be implemented following suspicion and/or confirmation of *G. salaris*. A floor plan showing the location of personnel operating within the NDCC, DSG and LDCC(s) may also be drafted, if necessary, following an outbreak. Wall and floor plans will be produced following official suspicion of *G. salaris* and displayed at the NDCC and the LDCC(s).

3.18 Job descriptions highlighting the roles and responsibilities of all the MSS staff who will be involved in an outbreak of *G. salaris* are located in Annex 2 of the manual.(See P155)

4. **Movement Restrictions**

4.1 The powers for issuing movement restrictions are provided by The Aquatic Animal Health (Scotland) Regulations 2009. Under this legislation, areas can be designated for the purpose of disease control where a disease is suspected or confirmed. The movements of live fish, eggs and gametes of fish, along with feedstuffs for fish, into, out of and within designated areas, are prohibited without the permission of the Scottish Ministers.

4.2 The DSG will be responsible for providing policy advice on the placement of all movement restrictions. It will be the responsibility of MSS to ensure that movement restrictions are imposed, in line with the current policy.

4.3 Confirmation of the presence of *G. salaris* will change the health status of affected area(s) and will lead to the creation of infected zones or compartments in line with Annex III Part A of 2006/88/EC. The requirements of either article 39 (for containment) or article 44(2) (for eradication) of 2006/88/EC shall apply. There are restrictions and implications associated with any movement of live and dead fish, equipment and personnel (as specified) out with infected areas, including the movement of fish for processing. All such movements will be subject to permission from the Scottish Ministers but in addition health certification may be required for movements into disease free zones or compartments in accordance with article 14 of 2006/88/EC.

Placement of movement restrictions

4.4 Movement restrictions can be imposed on a defined area following sufficient evidence of suspicion or confirmation of disease. Waters that are suspected as being infected may be designated by the making an Initial Designation Notice (IDN). With respect to waters within which disease has been confirmed the IDN will be withdrawn and replaced with a Confirmed Designation Notice (CDN). Buffer catchments can also be designated by means of an IDN or CDN as appropriate. Notices come into force from the date specified within the Notice. The making of CDNs is published through the Marine Scotland web site.

4.5 Following suspicion or immediate confirmation at a fish farm site, put-and-take fishery or wild freshwater fishery, the entire freshwater catchment will be placed under suspicion. Neighbouring catchments will act as Buffer Zones and will have movement restrictions applied. Suspect catchments will comprise of all water catchments which are deemed to be linked through water movements. The same criteria will be applied to the Buffer Zones.

4.6 Geographical Information Systems (GIS) will aid the identification of the area in relation to a suspected catchment(s) and buffer zone(s). The location of all fish farm sites within these areas will be identified, along with other data and information crucial to containment and eradication. Section 10 of the manual gives greater detail on the role of GIS.

4.7 An IDN will be served on all fish farm sites:-

- Within the water catchment(s) where suspicion has been identified;
- With epidemiological connections to the suspected site or suspect catchment(s);
- Within the Buffer Zone(s).

Standard Operating Procedure (SOP) FHI Admin 024 details the necessary procedure for serving movement restrictions.

4.8 All suspect freshwater catchments will be designated under the IDN. The IDN will cover all waters holding susceptible species, within that catchment. This will include all fish farms, put-and-take fisheries, and any other fish holding facilities, as necessary. SOP FHI Admin 024 details the necessary procedure for making an IDN. Notices will be copied to District Salmon Fishery Boards or, where none exist, to all fishery and riparian owners in the catchment(s) to which the Notice relates.

4.9 The immediate response may warrant the designation of all freshwater catchment areas in Scotland if initial suspicion and/or investigations suggest the possibility of the disease being widespread.

4.10 The size of the control zone will depend on the receipt of positive laboratory results and advice from investigations led by the Epidemiology Group.

Revocation of movement restrictions

4.11 As catchments are declared free from the parasite then movement restrictions will be withdrawn by making a Withdrawal Notice. SOP FHI Admin 024 details the procedure to be adopted when withdrawing movement controls. In many situations the decision to withdraw an IDN or CDN may be based around a programme of testing, devised by the Epidemiology Group, which demonstrates freedom from *G. salaris*.

4.12 In considering the withdrawal of movement restrictions the following parameters must be taken into account:

- Whether the disease has been confirmed within a suspect catchment;
- Whether eradication has been deemed to be successful;
- What epizootic links exist;
- In the case of negative results, whether sufficient sampling has been conducted within the suspect area;
- In a case of widespread disease with little chance of successful eradication being possible, whether the restrictions serve any useful purpose in limiting disease spread consideration may be given to varying the restrictions imposed.

4.13 Section 9 (See P148) of the manual looks at further criteria for demonstrating freedom from infection and should be consulted when considering the withdrawal of all movement restrictions for *G. salaris*.

Fish movements

4.14 In accordance with SOP FHI Admin 016, applications to move live fish, eggs and gametes of fish, along with feedstuff for fish, which are subject to movement restrictions for *G. salaris*, will be assessed by the FHI Duty Inspector (DI), or deputy. The DI should seek the advice of colleagues and discuss the application with Senior Fish Health Inspectors or Area Managers, as appropriate. In general, movements from infected areas into areas which are not known to be infected or where the disease status is uncertain will not be permitted. Permission may be granted from areas of equal disease status, or from an area of higher to lesser disease status. Permission may also be granted to move fish to seawater and for processing activity where appropriate measures are employed to reduce the risk of parasites spread. Measures will include appropriate disinfection practices, full containment of the animals or products, including water, in transit and appropriate measures surrounding containment of waste products and treatment of water effluent in relation to processing activity. Consideration must be given to the health status of receiving aquaculture zones or compartments when assessing applications to move fish.

4.15 Applications for movements will be considered using the risk assessment described in Appendix 4 of the plan. Duty Inspector will issue movement consents or refusals and copy to Marine Scotland Performance and Aquaculture Team who will deal with any appeals against the decision.

4.16 Examples of movement restrictions are contained within their respective SOPs. Annex 7 (Page 170) provides a list of all SOPs referred to within the manual.

4.17 Flow chart 2 (Page 173) provides an overview of the procedures involved in placing movement restrictions.

5. **Field Investigations**

5.1 The Fish Health Inspectorate field operations are laid down in the 'Fish Health Inspectorate Standard Operating Procedures' (FHI SOPs), many of which are accredited by the United Kingdom Accreditation Scheme (UKAS). Reference is made to many of the FHI SOPs, particularly within this section of the manual.

5.2 Following initial suspicion and/or confirmation, it is envisaged that a number of sites will need to be inspected and sampled, depending on the findings of the epizootic investigation.

5.3 An overview of the procedures involved in sampling sites is given in Flowchart 3(Page 174)

Preparations to inspect and sample

5.4 Prior to proceeding with any inspection and sampling, a number of actions will be required to be undertaken by the Inspector before commencing his/her field work. It is possible that the actions described below in relation to 'Arranging an inspection' and 'Collection of sampling equipment' may be completed by the Fish Health Inspectors deputy, especially in the situation where operations are being run from an LDCC.

Arranging an inspection

5.5 Field Inspectors should refer to SOP FHI Field 001 which lays down the necessary steps required in planning visits to fish farm sites. Much of this application will also be relevant in planning visits to put-and-take fisheries and wild fisheries. The wild fish file in Objective holds contact information for Scotland's District Salmon Fishery Boards (DSFB).

Collection of sampling equipment

5.6 In order to conduct sampling for *G. salaris*, equipment, as detailed within the Fish Health Inspectorate Checklist FHI 010, should be collected. In addition to what is specified for *G. salaris*, the inspector should ensure that he/she has all necessary equipment to conduct diagnostic sampling, as necessary, during field work.

5.7 In the event that extra provisions need to be sourced, contact details for suppliers are held by MSS. Section 10 of the manual details the procedures necessary for obtaining extra resources.

Disinfection of equipment on site

5.8 Inspectors will follow SOP FHI Field 029 which instructs the cleaning and disinfection of protective clothing and equipment when moving on and off sites. These procedures should be applied to all visits to fish farms, put-and-take fisheries and wild fisheries.

5.9 All disposable sampling equipment taken onto site and into the sampling area, should be classed as contaminated and must not be used at a different site or sampling location. This equipment should either be disposed of on site, appropriately, or stored within the inspector's vehicle in a sealed container away from samples and clean sample equipment. The equipment should then be disposed of appropriately at MSS Marine Laboratory.

Site inspection and information collection

5.10 It may be necessary for inspectors to work in pairs or teams when collecting samples from wild fish or when collecting a large number of samples. In such situations, the work will be agreed and shared accordingly. For auditing purposes records must be maintained which detail the actions of all persons involved.

5.11 Fish farm site managers, put-and-take fishery owners, biologists from DSFBs and Fisheries Trusts may also be able to provide assistance in the collection of fish from sample locations. In some situations they may be able to assist with sampling, provided adequate training has been given in accordance with SOPs FHI Admin 017 as necessary.

Case sheets

5.12 A case sheet should be completed in accordance with SOP FHI Field 002 for each field visit. When sampling fish farm sites or put-and-take fisheries, record sheet FHI 001 should be completed. When sampling wild fisheries, record sheet FHI 046 should be completed. Case sheets should be amended as necessary to include required fields.

Movement records

5.13 Movement records should be checked on site in accordance with SOP FHI Field 002. This SOP specifies the legislative requirement for fish farmers to maintain records and which information to document. For put-and-take and wild fisheries there are no legal requirements to record fish movements made either on or off site. As part of the investigation, and to provide valuable information to the Epidemiology Group (EG), enquires must be made to establish if any movements have occurred on or off put-and-take or wild fisheries. In accordance with the SOP, the inspector must obtain copies of any records that are kept

Mortality records

5.14 Mortality records will provide essential information to aid the epizootic investigation. Under the current legislation, fish farmers are obliged to keep mortality records. These records must be analysed in accordance with SOP FHI Field 002.

Medicine records

5.15 Under the Animal and Animal Products (Examination for Residues and Maximum Residue Limits) Regulations 1997, Fish Health Inspectors have the power to inspect medicine records held by a fish farmer. Analysis of these records is important when conducting statutory inspection and sampling for residues of veterinary medicines. Examination of these records will also be a crucial factor when selecting which fish to sample for *G.salaris*. FHIs should request inspection of these records during any visit in relation to an outbreak of *G. salaris* and avoid sampling fish recently treated with formalin or other anti-parasitic medicines, where possible. These records must be analysed in accordance with SOP FHI Field 002

Sampling programme

5.16 A management plan will be established for each area to ensure that all the necessary samples are taken and examined. All samples submitted will be identifiable by catchment. Once a site has been confirmed positive, then the entire catchment will be considered positive. From this point sample analysis should be concentrated on other suspect catchments, where the presence of *G. salaris* is unknown, to help establish pathogen distribution. Sample analysis will only then focus on establishing pathogen distribution within an infected catchment.

5.17 Consideration should be given to the sample size required in relation to the species being sampled. SOP FHI Field 028 and FHI Met 004 gives details of this.

5.18 The sampling programme for *G. salaris* will aim to establish the presence and distribution of the parasite. It will aid the Epidemiology Group to determine the origin of the disease and to demonstrate freedom from disease.

5.19 The priority to focus sampling and investigation will be as follows:

1. Suspect or ‘index’ case;
2. All sites with epizootiological links to the index case (e.g. fish movements, transporter connections);
3. Establish the disease distribution within infected catchments;
4. Consideration given to increasing the national sampling program – in non-suspect areas.

5.20 The first aim will be to confirm or rule out the presence of *G. salaris* in relation to a suspected case (index site). If sufficient suspicion remains, or *G. salaris* is confirmed, then an epizootic investigation will be conducted to establish the disease origin and spread – Section 6 of the manual (See P139) gives details of this procedure.

5.21 Secondly all sites with epizootiological links to the index case will be targeted as being of highest priority.

5.22 Thirdly, it will be necessary to conduct sampling within the buffer zones to establish the disease status there. If additional positive cases are found in the infected areas and buffer zones their limits may have to be revised and further epizootic investigation undertaken.

5.23 Fourthly, it will then be necessary to establish the disease spread within an infected catchment. All fish farms, put-and-take fisheries and wild fisheries will be sampled. Sites within an infected catchment, with an epizootic link to the index case will be targeted first, followed by all remaining sites within the catchment. Test results and data from these cases will be crucial to the eradication strategy, should this route be considered and chosen. Consideration should be given to distribution changes of the parasite over time, primarily due to fish migration and water movements. Environmental conditions may play a major role in parasite distribution.

5.24 Consideration should be given by epidemiologists and the NDCC to the possibility of increasing the level of surveillance for *G. salaris* at a national level. This will be dependent upon the individual situation and the pattern of disease and pathogen spread.

Selection of fish for sampling

5.25 Initially, the survey will be designed to detect the presence of *G. salaris* and not estimate its prevalence. Therefore, at this stage the focus will be on the highest risk groups present at the site (wild or farmed).

5.26 SOP FHI Field 040 describes the procedures to be adopted when inspecting fish on site, this should be followed along with SOP FHI Field 028 which lists the criteria to be considered when choosing which fish to sample for *G. salaris*.

Method of sampling

5.27 In the event of suspicion or confirmation, the method of sampling will be based on the OIE guidelines for sampling for *G. salaris*. The procedures required are detailed within SOP FHI Met 001, which may be summarised as follows:-

Whole fish should either be-:

- Examined on site for gyrodactylids. All observed gyrodactylids will be collected and preserved in alcohol; or
- Preserved in alcohol and returned to the laboratory at MSS for analysis; or
- Transported live to MSS or other laboratory as agreed.

5.28 It is recognised that these methods may not be practical in some situations. This will depend on the life stage (juveniles or adults) and the species (influencing the number of fish) being sampled. In such cases an alternative method of sampling may be appropriate - all fins (pectoral, pelvic, anal, caudal, adipose and dorsal) may be collected for the screening method.

5.29 Where the species of fish can be positively identified as Atlantic salmon (such as on an Atlantic salmon farm site) then samples of the pectoral fins only will be sufficient for analysis.

Sampling wild fish populations

5.30 Samples of wild fish populations will be sourced mainly by electro-fishing and gill netting according to SOPs FHI Field 046 and FHI Field 047. Where practical and possible, electro-fishing should be the preferred method of wild fish capture as gill netting may dislodge parasites prior to sampling. Fish passes, and fish ladders may be adapted to help catch fish for sampling.

5.31 The number of sample locations on a river system will be determined by the NDCC with input from the EG. Factors which will influence this will be-:

- The estimated Atlantic salmon population size and structure;
- The size and area of the catchment being studied;
- The presence of barriers (natural and man made) which can delineate the boundaries of different epizootic units within a catchment; and
- Environmental conditions which may influence the spread of *G. salaris*. This includes water temperature (influencing *G. salaris* reproductive rate) and water flow (controlling the dispersion of the parasite downstream and influencing fish movement upstream).
- If sampling involves areas designated as SACs/SSSIs may need to consult Landscapes and Habitats Division re Article 6 of Habitats Directive.(See Appendix 1, P32)

Transport of samples to the laboratory

5.32 Samples must be returned to the laboratory in accordance with SOP FHI Field 011. Samples for *G. salaris* do not require to be kept in cold storage but could be kept in the same box as other samples or in an additional box or bag. All samples should be secured in a sealed polythene bag and maintained in an upright position. To aid this, tube racks could be used, if necessary.

5.33 It should be noted that the transport of alcohol by Royal Mail is not permitted. As a result, a private courier service for the transportation of samples and paperwork should be considered. It may be necessary to establish a 'MSS courier service', especially in the situation

where an LDCC has been established. Scottish Government Procurement has a list of courier services.

5.34 The FHI DI, or deputy, will be responsible for unpacking and logging-in samples according to SOP FHI Admin 004. SOP FHI Admin 005 details the requirements necessary for distributing samples. The Fish Health Inspector will be responsible for his/her samples when returning with them, from the field.

6. **Epizootic Investigation**

6.1 The Epidemiology Group will lead the epizootic investigation. Field reports, data and results from inspector's cases will be crucial to identifying the hazards and risk of spread of disease.

6.2 The Epidemiology Group will provide advice on defining suspected catchments, buffer zones, sampling and surveillance programs designed to detect the presence and/or demonstrate freedom of *G. salaris* within certain catchments during both the initial investigation and following treatment of a river system.

6.3 The head of the Epidemiology Group will be a member of the NDCC and will be responsible for sharing information obtained from epizootic investigations with the group. Such information will be a crucial factor in the decision making responsibilities of both the NDCC and the DSG.

6.4 There will be a requirement for a direct communications link between the Epidemiology Group and:

- Laboratory staff – in the interpretation of results;
- The FHI regarding the interpretation of case notes, movement records and details of the sampling programme.

6.5 Following the establishment of a suspect or confirmed infected catchment, the Epidemiology Group should consider all links to other water catchments through the following:

- Fish movements between catchments;
- Water movements between catchments;
- Fish processing activities;
- Recreational activities.

Establishing the point of infection

6.6 The Epidemiology Group will attempt to determine the origin(s) of *G. salaris* present within a suspect or confirmed catchment and the likely time that the parasite may have been on site. It is anticipated that this may not always be possible and will often be extremely difficult, especially where *G.salaris* is associated with a rainbow trout site where no mortality or clinical signs of disease have been observed. In these circumstances, a practical approach should be to prioritise the links with the highest risk, as determined from case data, although all possibilities of infection must be considered. Tracings may have to go back several years if disease appears to be long standing, is present in wild populations or there are links to other earlier positive sites.

Fish movements

6.7 The movement of live infected and/or susceptible fish will pose the greatest risk with respect to the spread of *G. salaris*. This includes:

1) The intentional movement of farmed or wild stocks (legal or otherwise);
2) The unintentional movement of farmed or wild stocks (e.g. via water movements);
3) The natural movement and migration of wild fish species up and downstream and between catchments via brackish waters;
4) Escapes from fish farms and sport fisheries; and
5) Import of stock from a Gs free farm, zone or country that subsequently declares the existence of disease.

Movements of fish farm stock

6.8 In accordance with SOP FHI Field 002, movement records are inspected, checked and copies are obtained for analysis at the NDCC. The rapid analysis of such records is essential as live fish movements are the greatest risk factor for the spread of *G.salaris*. The analysis of movement records will be completed by the FHI and EG jointly.

Wild fish movements

6.9 Although *G. salaris* cannot survive full strength seawater, it can survive in brackish waters. The movement of wild fish between catchments may provide sufficient risk to include these areas under suspicion. Jansen, Hogasen and Brun (2005) identify the migration of infected fish in brackish water as a major factor relating to the spread of *G. salaris.* In Norway, it has been reported that river systems up to 20 km away have been infected by this means. It is perceived that this situation may be more common on the west coast of Scotland due to the relative proximity of river mouths in sea lochs within that area. This risk may be reduced somewhat, in relation to some east coast rivers.

6.10 There is also a risk from anglers moving live bait and water from one catchment to another. Where this activity has been identified to have occurred, a risk assessment should be conducted and consideration given to further actions including sampling and official suspicion based on the level of the activity and the associated level of risk.

Escapes of fish

6.11 Where escapes are known to have occurred, the infection pressure upon wild fish in a catchment system may be increased. However, suspicion or confirmation will immediately apply to the entire catchment following initial reports, so fish farm escapees will not change the immediate response in terms of the epizootic investigation.

6.12 Extra bio-security measures must be taken to prevent fish escapes and the risk of increased spread of *G. salaris*. Advice should be passed on to fish farmers by Inspectors during routine inspections. Where significant escape risks exist, early depopulation of the farm may be considered under powers in the Aquatic Animal Health (Scotland) Regulations 2009.

Water movements

6.13 Water movements between and within water catchments are necessary within the hydro electric and water supply industries. With respect to the spread of *G. salaris*, this activity is perceived as a lower risk than that associated with fish movements. However, the risk associated with this activity will automatically increase should infected/susceptible fish be transported through water movement to areas where Atlantic salmon populations exist.

6.14 It will be necessary to consider water movements from an infected (suspected or confirmed) catchment to an uninfected catchment and vice versa, as fish are able to swim against the current. The risk associated with this activity will increase with increasing frequency and volume of water being moved.

6.15 The Epidemiology Group should provide recommendations on whether to apply for revocation or suspension of water abstraction consents regarding water transfers, water to distilleries, power stations and fish farms. If this is not possible or refused, then the NDCC will require a recommendation from the Epidemiology Group on whether to extend the infected area and how far.

Angling and other risks

6.16 In relation to recreational activities, the greatest risk is perceived to result from fishing nets, fishing boats and fishing waders (especially with felt soled boots) that have been in contact with infected fish. Lower levels of risk are associated with other pieces of fishing tackle such as fly lines and flies etc.

6.17 Canoeists may also pose a risk through the movement of equipment between catchment areas and areas within a catchment. It is perceived that this risk is relatively low, although it may increase if the equipment has been in direct contact with infected fish.

6.18 It may be impossible to determine where the risks associated with these, and other leisure activities, lie following a *G. salaris* outbreak. No recorded system for the movement of anglers or leisure pursuits currently exists. Where there are reports of movements between catchments

with no or inadequate treatment measures taking place, then these should be investigated. The EG should assess the risk of any report and, if necessary, request that inspection and sampling should be conducted.

6.19 In the event of an outbreak, investigations into leisure activities will be risk assessed and efforts concentrated on those with the greatest perceived risk.

Processing activities

6.20 The Aquatic Animal Health (Scotland) Regulations 2009 grants powers to restrict the movement of dead fish – killed for harvesting or culling purposes. Movements of dead fish may be permitted only following approval from the Scottish Ministers and such movements will be subject to certain conditions as deemed necessary. There are also controls over the removal and disposal of mortalities.

6.21 There is a risk associated with processing establishments processing fish from a suspected or infected zone and discharging untreated effluent back into a water course containing susceptible species. A number of fish farms, including rainbow trout farms, process fish on site.

Epizootiological split of catchments

6.22 There may be strong epizootiological evidence that could support a proposal to split an infected catchment into areas that can be considered discrete with respect to the control of fish disease. This needs to be assessed at the catchment level and will be a key factor in an eradication plan. The process of constructing barriers, closing fish passes and water transfer pipes will be a crucial component to splitting catchments. The EG will make recommendations to split a catchment if it is thought to be appropriate. Movement restrictions will remain on the entire catchment (even after splitting) until sampling and demonstration of freedom from *G. salaris*. Following sampling which demonstrates freedom from disease, consideration may be given to the revocation of movement controls from the epizootiologically separate area.

6.23 Flow charts 4, 4a, and 4b (Pages 175-177) detail the procedures involved in conducting an epizootic investigation.

7. **Diagnosis**

7.1 Detection and diagnosis of *G. salaris* will be based on the principles and guideline recommendations detailed in the most recently updated version of the OIE Diagnostic Manual for Aquatic Animal Diseases. Specific diagnostic methods employed will conform to these principles, will be based on a thorough and scientifically rigorous validation prior to adoption and will be capable of standing up to independent scientific peer review. The current version of the OIE Manual is available at www.oie.int.

7.2 Procedures in relation to the method of sampling for *G. salaris* are detailed within the manual.

7.3 Laboratory staff processing samples for *G. salaris* should give consideration to any recommendations relating to sample processing.

7.4 All samples will be examined for *Gyrodactylid* parasites which will be identified using the methods described in the following SOPs:

- Mol-gen 060 - *Gyrodactylus* Morphological Examination and Dissection
- Mol-gen 061 - *Gyrodactylus* PCR
- Mol-gen 062 - *Gyrodactylus* RFLP
- Mol-gen 063 - *Gyrodactylus* Gelelectrophoresis
- Mol-gen 064 – Lysis of parasites
- Mol-gen 065 – *Gyrodactylus* Sequencing PCR and sequencing
- Mol-gen 066 – *Gyrodactylus* CO1 PCR
- Mol-gen 068 – *Gyrodactylus* identification using morphological features
- Mol-gen 071- Flexible scope: QPCR Amplification and detection from cDNA/DNA (procedure accredited for *Gyrodactylus* diagnostics but not listed in OIE manual)
- Mol-gen 102- Flexible Scope: Preparation of reagents in molecular genetics

7.5 All SOPs in relation to the diagnosis of disease are held by the Histopathology and Molecular Genetics Groups.

7.6 A Decision Tree for the diagnosis of *G. salaris* is located within Annex 4 of the manual. (See P161). This document should be consulted when interpreting results.

Notification of Results

7.7 Results are recorded on a Molecular Genetics report MG035 (molecular results) and on a Parasitology *Gyrodactylus* report (morphological results) and issued to the Duty Inspector.

7.8 As part of the confirmatory diagnosis procedure, the first identification of *G. salaris* in Scotland will be required to be confirmed by the relevant OIE Reference Laboratory. The head of the NDCC will be responsible for ensuring material is sent to the OIE Reference Laboratory by the quickest available route. Subsequent cases may be confirmed by the National Reference Laboratory without reference to the OIE Reference Laboratory. The address of the relevant OIE Reference Laboratory is as follows.

National Veterinary Institute
P.O. Box 8156
Dep., 0033 Oslo
NORWAY
Tel.: (47.23) 21.61.10, Fax: (47.23) 21.61.01
E-mail: gyrodactylus@vetinst.no

7.9 Further diagnoses do not require confirmation by OIE but the Head of the National Reference Laboratory may seek confirmation in doubtful cases e.g. if samples come from

supposed disease free areas or from areas where are trying to demonstrate freedom from disease after a treatment regime.

8. Eradication

8.1 The policy aim is to eradicate *G. salaris*. However, in some situations this may not be achievable. In this case, a policy of containment will prevail. Any plans for eradication require approval through the commission assisted with the support of the Standing Committee on the Food Chain and Animal Health, in accordance with article 44(2) and 62(2) of Directive 2006/88/EC.

8.2 The decision to implement an eradication programme will be made by the Scottish Ministers. They will consider a report from the DSG, which will highlight the main issues regarding the possibility of treatment – see section 5.11 and 5.12 of the plan. Appendix 3 of the plan details many of the factors that the DSG will consider when determining the feasibility of eradication. (See P48)

8.3 If eradication is deemed possible, then a number of surveys will be required to be conducted. All necessary equipment must be obtained and a plan, containing a detailed time frame of events, should be drafted prior to a treatment. The decision to eradicate may be reviewed at any point, should additional information reveal further difficulties or issues.

8.4 At the point of first detection, an immediate treatment to eradicate *G. salaris* may be applied, if this is considered practical. Experiences from Norway suggest that this could prove beneficial to the long term eradication of *G. salaris* and help restrict the spread of the parasite.

8.5 Eradication protocols and/or SOPs will be drafted in the event of an outbreak of *G. salaris*. These will be specific to the catchment(s) concerned and will highlight the activities of MSS in:-

- Assessing the possibility of treatments;
- Surveying;
- Planning treatments; and
- Conducting treatment(s).

NB Help in planning and implementing an eradication programme may be available from Norway. This will be arranged through Scottish Government Marine Scotland. It should be noted that SEPA holds considerable chemical, physical and hydrological data on many rivers and catchments and this may prove invaluable in any eradication programme.

8.6 Flowchart 5 (Page 178) details the procedures involved in implementing and conducting an eradication programme.

Project Manager

8.7 A Project Manager (PM) will be appointed by the DSG. The PM will provide advice and expertise in relation to eradication. Practical experience of eradication programmes for *G. salaris* will be a desirable requirement for this post. The PM may be involved at an earlier stage on a consultation basis when assessment is made into the feasibility of eradication.

Planning

8.8 In planning any containment or eradication strategy the Project Manager must ensure that full risk assessments are carried out for all activities and that staff read them and act on them. All casual staff and contractors must also be made aware of assessments and follow them.

8.9 The location of existing barriers and potential areas for barrier construction (both temporary and permanent) must be identified. In addition, the number, location, distribution and type of treatment station to be deployed, must also be established, based on hydro-geographical data and water chemical analysis.

8.10 The GIS mapping system will supplement hydro-geographical data and aid identifying the location of treatment and barrier points. Large scale maps will be produced displaying these locations and will be held at both the LDCC and the NDCC.

8.11 Advice from the Epidemiology Group will be necessary to determine where and if water catchments can be split using barriers, to aid the treatment of a water catchment.

8.12 Teams will be required to be built and trained in their specific roles. These will include: chemical application; the collection of all mortalities; and sampling to collect biological information. The PM will play a crucial role training all staff members within their roles, specific to eradication.

8.13 As part of the planning process, all water abstractors must be identified and kept up to date with the proposals of the treatment plan. During the treatment period additional water supplies may be required to be sourced. Consideration will be given to notifying pet owners and farmers whose animals are in contact with an infected catchment undergoing treatment.

Surveying

8.14 Prior to any treatment programme, it will be essential to conduct thorough and detailed surveys to identify the characteristics of the water catchment (or section of water catchment) under examination. Surveys will be required to gather information on:-

- Hydro-geography and water chemistry, to include drinking water supplies, large drainage pipes and large bodies of water to be conducted by SEPA and Scottish Water;

- Fish populations, to be conducted by Marine Scotland Freshwater Laboratory (MSFL) and SNH;

- Significant populations of invertebrates, to be conducted by MSFL and SNH;

- Any sites of special interest, advice to be provided by SNH;

- All potential sites for permanent and temporary barriers. This will include fish passes, dams, fish counters, lades and salmon ladders. To be conducted by MSFL and DSFBs with assistance from Fisheries Trusts;

- Sites where permanent barriers currently exist, to be conducted by DSFBs and MSFL, advice to be provided by the GIS group.

- Treatment should, ideally, take place at times of low water flows and when the majority of migratory salmon are at sea.

8.15 It may be necessary to survey at various times of the year in order to determine seasonality ranges especially in relation to hydrology, the extent of the catchment accessible to salmonids, water chemistry and changes in freshwater fauna populations.

8.16 The information obtained from surveying will be crucial to the development of an environmental impact assessment. This will be completed to establish the impact of any chemical treatment upon the catchment and wider environment. It is likely that SEPA will be able to facilitate with this role by providing data on water hydrology etc. However, before an application to treat under CAR can be considered by SEPA information on toxicity, river flows etc will be required. SEPA should be consulted at an early stage in the process to ensure that they are provided with all the information that they require to determine an application under CAR.

8.17 Appendix 9 (Page 113) of the plan identifies the options, requirements and further research in relation to Gene Banking. Gene banking will play a vital role in the preservation and restoration of wild Atlantic salmon stocks, along with other fish species, in the event that eradication measures involve the use of a piscicide.

Equipment

8.18 Equipment requirements must be identified. The sourcing of equipment associated with eradication will be the responsibility of the Scottish Government Procurement (SGP). Consideration must be given to equipment required for:-

- Setting up and operating a LDCC (if not already established);

- Building permanent and temporary barriers;

- Chemical storage, chemical dispatch stations and drip stations;

- Additional personal protective clothing – waders, dry suits, life jackets or flotation aids, gloves, face masks, protective goggles;
- Boats, nets, hand-nets, bags and bins to collect and transport dead fish;
- Consumable equipment required to collect biological material from dead fish, inclusive of gloves, bags, dustbins or similar containers;
- Suitable vehicles to transport people, equipment and dead fish;
- Facilities to store and treat dead fish (located at the LDCC);
- Disinfection facilities, to be established throughout the operation;
- Additional electro-fishing equipment, could be sourced from Fisheries Trusts and DSFBs;
- Plant and machinery equipment to allow barrier construction;
- Rotenone or alternative piscicide.
- On site laboratory especially if using aluminium sulphate

8.19 Further details of equipment required for treatment regimes are given in Appendix 8, Annex 1, of the plan (See P105).

Treatment

8.20 Treatment should be conducted when the water level is at its lowest point and ideally when few adult salmon are within the river system. If possible, treatment should follow the spring smolt migration to sea. Consideration must be given to weather conditions which could impact upon the success of a treatment. Postponing a treatment would have consequences in relation to wasted time, effort and money and additional planning associated with a new treatment plan. Consideration should also be given to timing treatments so that they are carried out, if possible, when least damage would be done to distilling, hydro- electricity and water transfer activities. Advice from Norway suggests that two treatments should be carried out close together.

8.21 Following and during treatment, dead fish will be collected from the river system using nets where necessary. Large volumes of dead fish can be expected when rotenone is used but much smaller numbers when aluminium sulphate is the treatment. Advice will be required from local knowledge source(s) to identify where mortalities are most likely to be found. Sampling to gather biological information will be considered and conducted at the LDCC or a laboratory which is approved by MSS.

8.22 Mortalities and waste material must be disposed of in accordance with the Animal By-Products (Scotland) Regulations 2003.

8.23 Following treatment, the section of river will be electro-fished to determine the success of the treatment. If live fish are caught, following rotenone treatment, then the treatment must be considered to have failed. The use of aluminium sulphate will lead to much lower mortalities but electro-fishing will be required to catch fish for examination to detect if any live parasites are still present. Consideration to the timing of further treatment(s) must be made taking into consideration any failures of the initial plan. If the treatment is deemed to have been a success then all equipment must be cleaned and disinfected before being moved out of the area and into the next section of river to be treated.

8.24 Where fish farms containing susceptible species, or species which could act as carriers of *G. salaris*, are present, then these facilities must be cleaned, disinfected and fallowed before treatment and not re-stocked until after a successful treatment has been administered.

Restocking

8.25 Restocking, possibly with sentinel salmon parr populations, will be conducted. Stocks held within gene-banking facilities could be used for this purpose. A testing programme will be implemented which will, at least, meet the requirements of Commission Decision 2010/221/EU. If there is no evidence that *G. salaris* is present following this, then consideration will be given to declaring the catchment as being free from *G. salaris*.

9. **Demonstrating Freedom from *G. salaris***

9.1 Following confirmation of *G. salaris* and investigations into the distribution and pattern of disease spread, consideration will be given to establishing or demonstrating freedom from the disease for certain areas of Scotland. A risk assessment will be conducted in relation to withdrawing movement restrictions, the following areas will need to be considered:-

- Non-suspect sites (fish farm, put-and take fishery and catchment);
- Sites within Buffer Zones;
- Suspected, but unconfirmed sites and catchments;
- Confirmed sites and catchments.

9.2 Non-suspect sites with no epizootiological links and no indication of disease can be considered free of *G. salaris* with no additional screening or testing is required. However, the decision for a national testing programme in accordance with disease free declaration will be made by the NDCC with input from the Epidemiology Group, DSG and the Expert Group on *G. salaris,* as necessary.

9.3 Sites within Buffer Zones surrounding infected catchments must be tested regularly whilst the catchment remains infected. Provided that their status remains negative, then these sites and

catchments can be declared free following successful eradication within the confirmed catchment which they surround.

9.4 Suspected but non-confirmed sites and catchments will be declared free from *G. salaris* following adequate sampling and negative test results. The level of testing will be determined by the Epidemiology Group.

9.5 Confirmed sites and catchments can be declared free following the completion of an eradication programme. If rotenone has been used the catchment will need to be re-stocked with Atlantic salmon populations, and re-tested with negative results. The use of sentinel salmon populations may be considered for this purpose. The site(s) and catchment(s) must, at least, meet the conditions specified in Commission Decision 2010/221/EU, to be declared disease free. If treatment has been with aluminium sulphate only sampling to catch live fish and examine them for presence/absence of the parasite can be carried out. When both chemicals have been used in combination the establishment of disease freedom may require different measures in different parts of the catchment.

9.6 Where there are no wild salmonids associated with an infected site, then a programme to demonstrate freedom could begin following the removal of all infected stocks, cleaning and disinfection of fish farm tanks and ponds and re-stocking. This situation may apply to a freshwater fish farm discharging water effluent direct to the sea. Consideration may be given to testing non-susceptible species which may be harbouring the parasite.

9.7 The Epidemiology Group will advise the DSG of the level of testing required to demonstrate freedom from *G. salaris.* Eradication plans must be approved by the European Commission.

9.8 Surveillance to determine disease freedom following treatment will have to take account of the following factors:-

- Number of sites to be sampled
- Accessibility of sample sites
- Number of times per year to be sampled
- Number of fish to be sampled at each site at each sampling, considering sampling confidence levels
- Temperature of water (likely to be very little fish or parasite activity in cold winter conditions experienced in Scotland
- Water flows

<u>The use of sentinel salmon parr populations</u>

9.9 The use of sentinel Atlantic salmon parr populations may be considered when developing a sample programme. Since Atlantic salmon are more susceptible to *G. salaris* then it is more likely that the parasite will be detected upon this species in a situation where infection may be low, for example:

- On a rainbow trout fish farm or fishery;

- At wild fisheries where salmon populations are small (it could be argued that in such circumstances a population of *G. salaris* will not be able to be sustained).

9.10 In addition, the use of sentinel Atlantic salmon populations may be a valuable tool in determining the success of an eradication program.

9.11 Should this option be implemented, care must be taken to ensure that disease is not inadvertently spread between water catchments, fisheries and farms. It is suggested that certified disease-free stocks are used.

9.12 Gene banking facilities could be utilised in providing stocks for sentinel population studies.

9.13 If live fish are to be used as a sentinel population there may be the requirement under the Animal (Scientific Procedures) Act 1986 to obtain a Home Office licence to permit this activity.

10. **Resources**

Staff recruitment

10.1 Depending upon the scale and size of the outbreak and the subsequent epizootic development, additional staff may be required to aid with field and laboratory investigations from initial suspicion through to eradication.

10.2 MSS has an approximate total of 320 staff of which ~70 are based within the Aquaculture and Aquaculture and Fish Health Science (AFHS) programme. It is reasonable to assume that many laboratory staff within AFHS will be involved in sample processing and diagnosis, the larger the outbreak the more so. Groups which are not actively involved in processing *G. salaris* samples and the diagnosis of the parasite may be able to provide a supportive role in both laboratory and field operations. This is highlighted within Annex 1 of the manual. (See P154

10.3 Consideration with respect to staff recruitment should be given to the following groups who could provide assistance during an outbreak:-

- Former staff with relevant experience;
- MSS Freshwater Laboratory (FL) staff;
- Cefas/DARDNI staff
- Animal Health Agency (AHA);
- Local and National Veterinary Inspectors and Practices;
- Water Bailiffs;
- Fisheries Trust Biologists;
- University biologists and veterinarians;
- Suitable Government Laboratories;

- Suitable Private Laboratories.
- VESO from Norway

10.4 MSS staff should be given training in *G. salaris* investigation techniques within the first six months of their appointment. This should be reinforced as required. A similar training programme will be given to seconded staff. Consideration should be given to providing a regular programme of training for veterinarians and biologists in preparation for an outbreak of *G. salaris*.

10.5 A list of trained personnel is maintained by MSS with relevant contact details. The training programme will be required to be on-going with regular refresher courses for all relevant staff.

10.6 Training SOPs (FHI Admin 017, 018 and 019) are available for new Fish Health Inspectors. Relevant sections from these will be applied to the training of new staff in the event of a *G. salaris* outbreak.

10.7 Induction training will be required for all personnel seconded to laboratory duties inclusive of the processing of samples and identification of gyrodactylids.

Equipment

10.8 SG Transport Group can supply transportation (pool or hire cars) for inspectors, as required. In addition, stocks of equipment which could be used for *G. salaris* sampling are held at MSS.

10.9 In the event that extra or alternative transportation is required and extra equipment needs to be sourced, then the Scottish Government Procurement will deal with this in the short term. Requests will be made to the Scottish Government Procurement for long term supplies of equipment, as necessary. This will be the responsibility of the head of NDCC.

10.10 MSS FL will be able to provide access to additional sets of electro-fishing equipment which could be used to supplement a wild fish sampling programme. Additional sets may also be provided by Fisheries Trusts and DSFBs. Extra electro-fishing equipment may need to be purchased in the event of an outbreak.

10.11 Consideration must be given to other statutory and operational duties of the whole of MSS when designating equipment and resources to a containment and/or eradication programme for *G. salaris*. When there are conflicts in work priorities it will fall to Head of DSG and Head of NDCC to resolve the issues and decide what work can be delayed.

Geographical Information Systems (GIS) mapping

10.12 As part of the containment and eradication programmes, GIS mapping tools will play an essential role in the delineation of suspected water catchments and the location of fish farms and put-and-take fisheries.

10.13 The GIS Group at MSS Marine Laboratory will be responsible for providing maps and information to the NDCC, FHI, DSG and the Communications Directorate, as necessary. A number of Fish Health Inspectors have a limited level of training in the GIS procedures. These Inspectors may be able to assist in map production.

10.14 A suitable GIS system will encompass a number of datasets. It should consider the following issues:-

- **Fish Farm Location -** including current status in terms of operation, water supply information and stock details;

- **Geographical Information** – river network, terrain (including altitude and impassable barriers to salmon movement), river flow information, location and volume of water transfers within and out-with the catchment;

- **Environmental Information** – biological information such as habitats, species that are present, including transport hosts;

- **Socio-economic Information** – settlements (villages, towns, cities), domestic and commercial water supply information;

- The method is to include river catchment delineation, downstream river delineation, volumetric calculations and a suite of treatment options for different GIS points.

10.15 The GIS system for Scotland requires some development in order to encompass all of the necessary data as detailed above. The ITU will identify the necessary steps and data holdings in order to construct a suitable system. Input from other agencies and bodies such as SEPA and Scottish Hydro-Electric may be essential to aid development.

10.16 Scottish Government Geographic Information, Science and Analysis Tea, (GI-SAT) may also provide input in the event of an outbreak of *G. salaris*.

10.17 Procedures for the development and production of GIS maps are held by the ITU.

Annex 1 - Set up and communication links between the DSG, NDCC and within the NDCC

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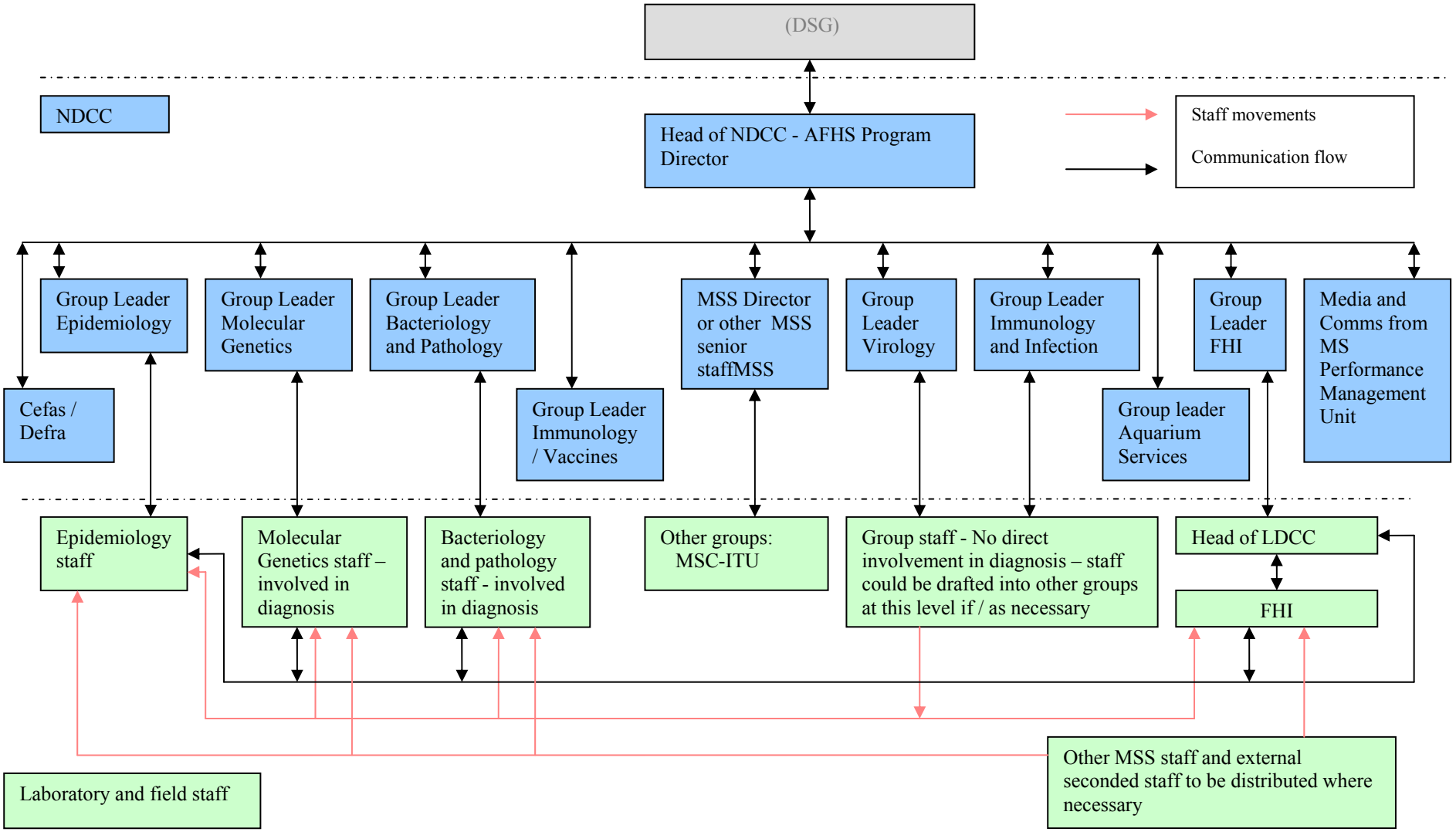

Annex 2 - Responsibilities and job descriptions

NDCC

Within MSS there will be both supportive and active roles for staff members. Supportive roles are those in which staff within one team or group will aid or support staff members within an active group, who will have a defined role in relation to the operation.

Head of NDCC – Please refer to Section 3.5 (Page 14) of the plan which gives details of the main responsibilities of this role.

Members of the NDCC

Members of the NDCC, as identified in Annex 1 of the manual, will:-

- Provide advice in relation to suspicion, confirmation, epizootic investigations, surveillance, sampling, application of control measures,

- Advise on decisions that will impact on MSS operations, and be responsible for disseminating information from the NDCC to relevant staff members.

Group Leader of FHI (or deputy) will:-

- Be a member of NDCC and will be responsible for reporting upon developments and progress in relation to field work, surveillance and sampling. They will input knowledge in relation to the practicalities of a field investigations program. They will be responsible for prioritising the processing of samples.

FHI Area Managers will be responsible for running Local Disease Control Centres (this responsibility may be delegated to a senior Fish Health Inspector). One may act as deputy for the Head of the FHI and fulfil his/her functions as required. They may also be required to take on the duties of a Fish Health Inspector.

Fish Health Inspectors will:-

- Conduct administrative tasks in relation to the placing of movement restrictions,

- Conduct inspection sampling at all appropriate sites,

- Be responsible for training other organisations or staff in relation to taking samples,

- Operate out of an LDCC as required and be responsible for the maintenance and upkeep of such a centre,

- Be responsible for notifying Area Mangers and Head of FHI of all results from cases, information obtained during field work, clinical signs of disease observed or obtained when conducting inspection and sampling,

- Be responsible for implementing eradication procedures in consultation with experts in this field,

- Be responsible for acting as Duty Inspector when required and dealing with all queries in relation to *G. salaris* from staff, industry, wild fish interests and members of the public. (NB Any queries from newspaper, radio and television journalists must be directed to the communications staff within the Performance Management Unit who will liaise with Communications Co-ordinator),

- Act as MSS Duty Inspector and assist to man a helpline which provides information for industry and general public,

- Provide advice on best practice to prevent disease spread.

The Director of MSS or other appropriate senior staff will be a member of NDCC and have responsibility for organising the administrative functions of the NDCC to ensure that:-

- Telephone calls, faxes and correspondence are dealt with appropriately,

- Paper and electronic filing systems are maintained in such a way to ensure that the systems are fully auditable,

- Support is provided to the NDCC to record notes, minutes and actions, and to issue and distribute reports to all relevant staff members, and

- Other Groups, such as ITU provide appropriate support.

Group Leader Epidemiology (or deputy) will be a member of the NDCC and provide advice on:-

- Epidemiological issues – surveillance, buffer zones, catchments connected through fish movements, water movements and other risks,

- Statutory sampling in relation to both the number of fish and type of samples to be taken,
-
- The location of sample points on a river system,

- Epidemiological separation of areas of a catchment in relation to treatment and the construction of fish barriers, and

- Priority processing of samples.

Epidemiology staff will:-

- Assist in providing advice to the head of Epidemiology and the DSG in relation to the roles and responsibilities of the Epidemiology Group as detailed above,
- Assist in statutory and diagnostic sampling and may be trained to conduct and aid field investigations.

Group Leader Bacteriology and Pathology (or deputy) will be a member of the NDCC and provide advice on:-

- The morphology of *G. salaris* as appropriate and pathology of fish infested with *G. salaris*,
- Case results and diagnostic methods.

Histopathology staff Parasitologists will:-

- Process and examine samples for gyrodactylids,
- Conduct morphological analysis and process samples prior to molecular genetic analysis,
- Be responsible for passing material to the molecular genetics group, and

Group Leader Immunology and Infection (or deputy) will be a member of the NDCC.

Immunology and Infection staff will:

- Conduct morphological analysis and process samples prior to molecular genetic analysis,

Group Leader Virology (or deputy) will be a member of the NDCC.

Group Leader Molecular Genetics (or deputy) will be a member of the NDCC and provide advice on:-

- Case results and diagnostic methods,

Molecular Genetics staff will be responsible for:-

- Conducting morphological analysis and processing samples for molecular genetic analysis,
- Reporting results to the head of Molecular Genetics.

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MS Communications staff will:-

- Be responsible, in conjunction with the Communications Coordinator for handling local media enquires and placing information onto the MSS website. MS communications staff must work in direct, close contact with representatives from Communications Directorate of Scottish Government and other relevant agencies to ensure the delivery of a consistent message and response. Be responsible for dealing with interview requests of various members of staff.

Communications Co-ordinator – will be a senior member of the DSG and will ensure that communication is maintained between the DSG and the NDCC as well as within both of those groups. They will liaise directly with the Communications Directorate staff to ensure external communications (to public and press) are maintained as necessary.

Other Staff members

Some AFHS Groups will have no direct role in relation to the processing of statutory samples for *G. salaris*. Such staff members will have a supportive role to play in the event of an outbreak of *G. salaris*. In addition other programmes within MSS and wider Marine Scotland may be able to provide staff resources, along with external bodies and stakeholders (refer to section 10 of the manual).

With appropriate training such staff may assist in:-

- Supporting laboratories processing incoming samples,
- Statutory sampling and may be trained as field inspectors, and
- Administrative duties.

Consideration must be given to current workloads and a decision will be made by the head of the NDCC in consultation with the Management Board with respect to the deployment of staff to different Groups.

Cefas and Defra - Following an outbreak of *G. salaris* in Scotland it is possible that fish farm sites, fisheries and subsequently freshwater catchments in England could be affected. An outbreak of *G. salaris* involving the river catchments of the Tweed and/or Border Esk (refer to section 1.20 of the plan) will also involve English waters. In these situations staff from Defra, Environment Agency and Cefas will have responsibility for controlling the outbreak in English waters and Ministers of SG and Defra will liaise in determining policy. The Head of NDCC in consultation with Head of DSG will be responsible for requesting help from Defra and Cefas if it is required in Scotland.

Annex 3. Considerations for establishing the LDCC

These instructions highlight some of the necessary steps and considerations to be made when setting up a Local Disease Control Centre (LDCC). The LDCC may be a crucial component to the containment and eradication programmes conducted in response to an outbreak of *G.salaris*.

The NDCC, in consultation with the DSG, will be responsible for establishing any/all LDCCs, in conjunction with Scottish Government Procurement (SGP). Appendix 8 (Page 101) of the plan and Section 10 (Page 150) of the manual details this further. The control of the LDCC will be the responsibility of the NDCC.

The LDCC will be run by a member of the Fish Health Inspectorate, either a Senior Fish Health Inspector or an Area Manager. They will be responsible for briefing and informing field staff of any decisions, operational changes or information which will impact upon their work. The Head of the LDCC will maintain close contact with the NDCC and Expert Group, as necessary.

Considerations

Prior to the establishment of the LDCC considerations must be given to the following:

1. Location

The location of the LDCC is crucial and this must benefit and facilitate the operation of field staff during containment and eradication programmes. DSFBs and Fishery Trusts along with other stakeholder groups and organisations may be able to assist in providing or identifying suitable accommodation, or sites for accommodation for the LDCC.

2. Facilities

The facilities of the LDCC should:

- Allow staff to wash and dry protective clothing and clothes;
- Include a hot and cold water supply with sink/drainage system and electrical power supply;
- Include a sampling or post mortem area to deal with fish submitted for differential diagnosis;
- Have access to a laboratory if treatment with aluminium sulphate is envisaged to check the aluminium levels and advise on adjustments to dose rates.
- Have adequate car parking facilities for the number of staff operating from the centre (consideration should be made for visitors and seconded staff);
- Have telephone and network connections to allow adequate communication links with the NDCC; and
- Maintain adequate security to ensure the protection and safety of all staff and equipment.

In addition to the above, the LDCC, assisted by SGP, should be able to provide adequate accommodation for staff or be situated in close proximity to adequate accommodation. This may be either in the form of B&Bs, local hotels, hostels or equivalent. Arrangements must

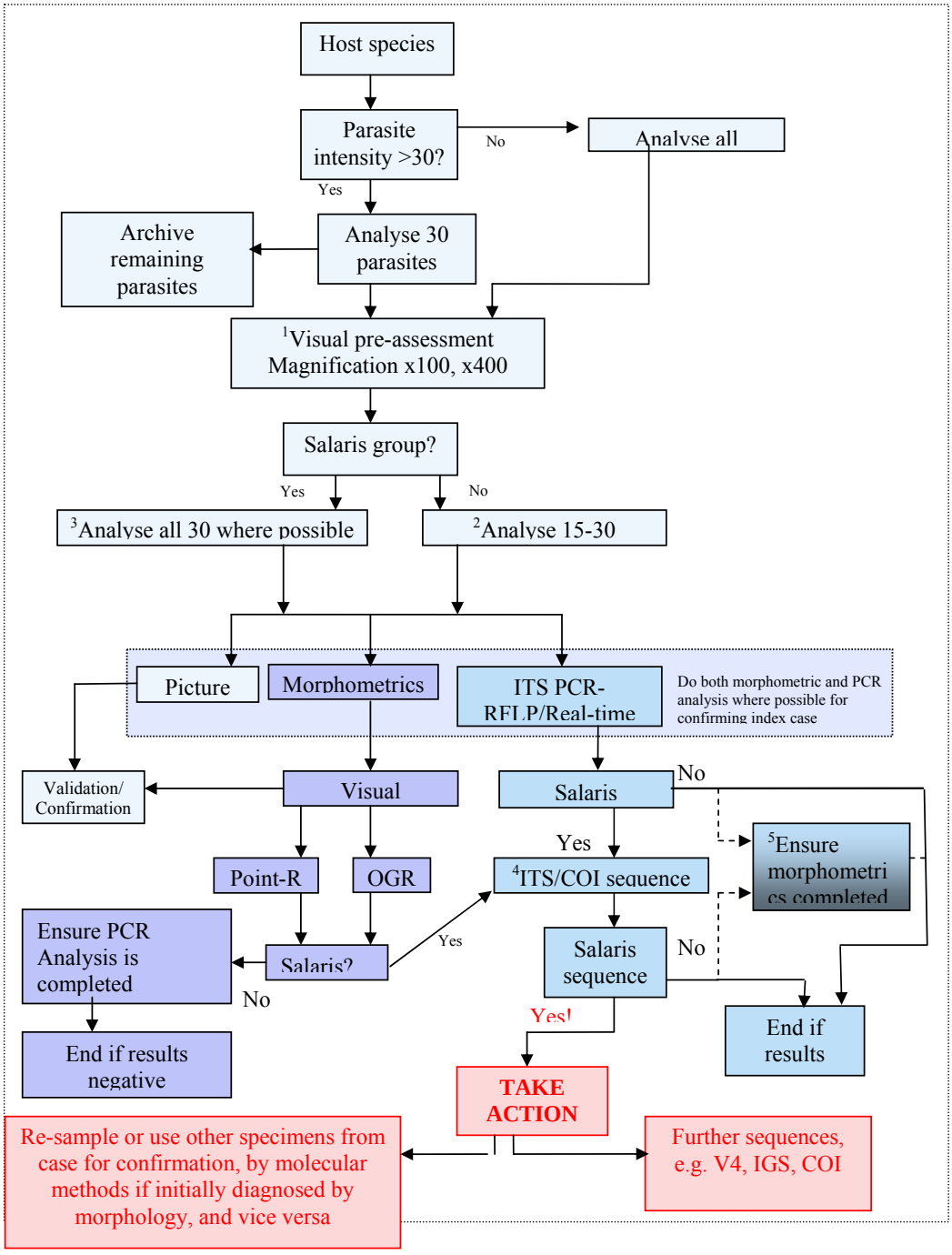
be made to ensure that adequate food provisions are provided at meal times for all staff working out of the LDCC. These may be provided by the LDCC or by an external provider.

Each LDCC will maintain a detailed mapping system (provided by the GIS group) showing the catchments it is associated with. The mapping system will highlight:

- The location of fish farms, put-and-take fisheries and other fish holding facilities;
- The location of sampling points;
- Details of result summaries from all areas sampled;
- The location of fish counters, fish passes, lades and barriers (natural and man-made) with photographs and information relating to their current status.
- Problematic areas such as large bodies of water;
- Positions of major abstraction points.

Where present, the local DSFB may be able to assist with the production of some of the above data. Appendix 4 Annex 2 (Page 65) of the plan details an example of the information required in relation to catchment characteristics for the River Dee. Section 10 (Page 150) of the manual gives detail of GIS mapping.

Annex 4 - Decision tree for diagnosis



[i]f laboratory is unfamiliar with morphological processing and identification it may be more expedient that they go straight to a molecular technique (ITS/RFLP or Real Time PCR). This may result in whole parasite being lysed as separation of haptor for morphological

analysis is time consuming. There may be issues with provision of material for OIE confirmation if few positive specimens found.

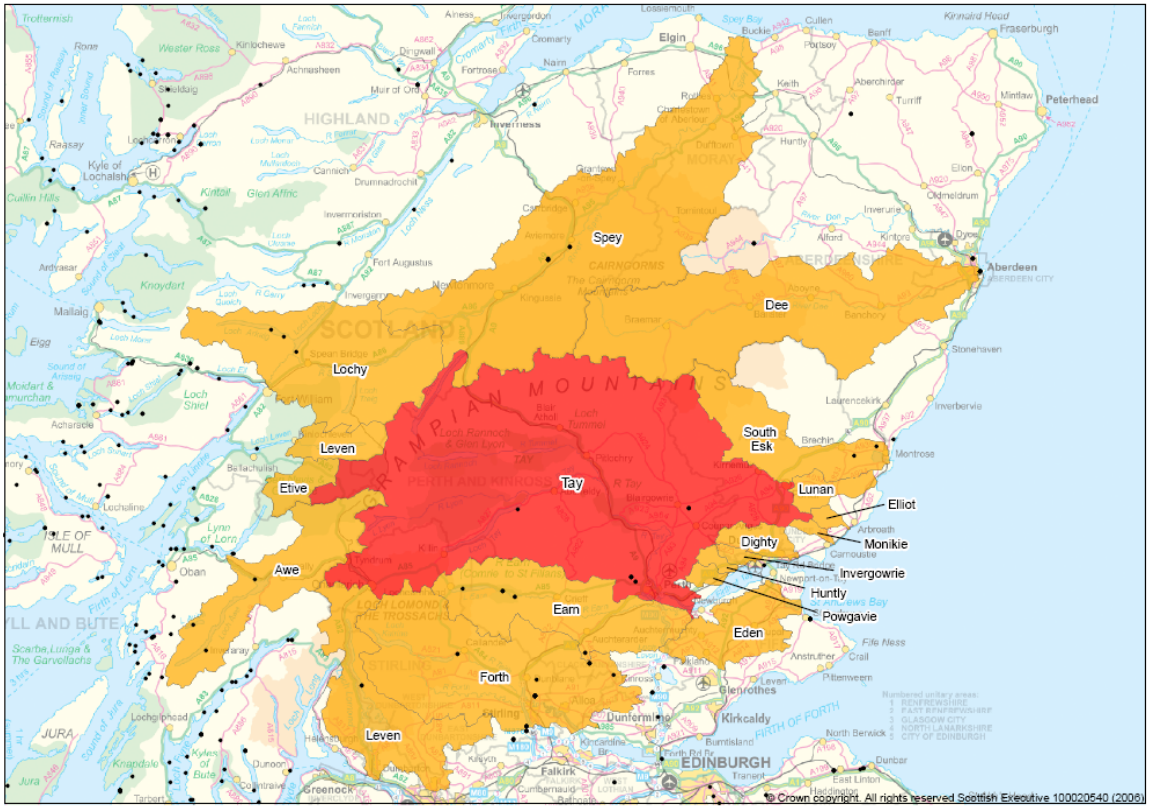
[2] If lab sufficiently skilled in morphological identification and if morphological preparations of sufficient quality, then may not be necessary to carry forward to molecular analyses.

[3]Once index case confirmed, need only process further those specimens with *G. salaris* morphology.

[4]Once index case confirmed can amplify COI only for subsequent positive RFLP/Ct specimens.

[5]Once index case confirmed can process specimens using molecular techniques only (OIE manual states that while use of both methods are best, molecular alone is sufficient but morphology must be confirmed by molecular analyse

Annex 5. Example of suspect/confirmed catchment with buffer zones



Example of an infected freshwater catchment (Tay) represented in red. This is surrounded by 18 further freshwater catchments acting as Buffer Zones. Black dots represent the location of active fish farm sites.

Annex 6a - Question and answer brief

The following questions may be asked following a case of suspicion or confirmation of *G. salaris*. It is envisaged that the responses will be modified to suit the individual suspected or confirmed outbreak. In the event of an outbreak, these questions and answers will be posted on the MS website. The MS website forms part of the SG website where further information on *G. salaris* can be obtained, this includes a copy of the plan and information regarding the 'Home & Dry' campaign. The question and answer brief will be regularly reviewed and updated. It will evolve with input from DSG, NDCC, the Expert Group on *G. salaris*, Stakeholders, AFHP, MSS and other necessary parties.

Q1. What is *G. salaris*?

G. salaris is a fish parasite which causes disease (known as gyrodactylosis) in wild and farmed Atlantic salmon parr and smolts (young fish ready to migrate to sea). A number of other salmonid species are susceptible to infection including rainbow trout, Arctic charr, North American Brook trout, grayling, North American lake trout and brown trout – although these species do not exhibit the clinical signs of disease. Other freshwater fish species of fish may also act as hosts and vectors for the spread of the parasite. As *G. salaris* can not withstand full strength saltwater, then seawater species or seawater life stages of fish are not affected by this parasite.

Q2. Where does/could it come from?

G. salaris is restricted in its distribution to Europe. It has been found in several (mainly northern) European countries within Atlantic salmon parr from rivers in Russia, Sweden and Norway and one farm in Latvia. It can be common in rainbow trout without showing the characteristics of disease. As a result, the parasite may be more widely distributed than currently believed and while the parasite has been identified on rainbow trout on farms in Germany, Macedonia, Poland and Italy, the status of many other European countries is unknown.

Q3. How could it get here? (or adapt for how did it get here?)

The greatest risk to the introduction of the parasite into the waters of Great Britain is through the importation of infected or susceptible fish from an infected area or an infected country. There may be a risk associated with the importation of fish eggs which have not been adequately disinfected (refer to OIE guidelines on egg disinfection). Leisure activities such as angling and canoeing may also pose a risk to the parasites introduction and subsequent spread, where contact with infected fish and/or infected water is made. Advice on measures to prevent introduction of the parasite can be obtained from the Scottish Government Marine Scotland, Victoria Quay Edinburgh.

Q4. Can *G. salaris* be transmitted via marine waters?

G. salaris is a freshwater parasite but it has an almost normal reproduction rate at 5% salinity. Survival time at higher salinities reduces but may still be significant: - for example *G. salaris* survives for up to 240 and 42 hours at 10% and 20% salinity, respectively. At full strength seawater the parasite has been observed to become immobile within 20 minutes and is not

expected to survive for a significant period of time. Whilst transmission via full strength seawater may not be deemed a significant risk for most cases, transmission via brackish and estuarine waters may pose a significant risk especially to those fish in the process of migrating back into freshwater.

Q5. How can I avoid introducing *G. salaris* into Scotland?

Fish Farmers – Only source stocks from certified disease free sources. All imports of salmonid eggs must be disinfected following import and before lay-out (refer to current OIE guidelines). You must ensure that MSS Fish Health Inspectors are informed of your intention to import prior to the event taking place. Please give as much notice as possible. By law you are required to give at least 24 hours notice prior to importation.

Leisure Pursuits – The largest risk is associated with equipment which has come into contact with infected fish and/or infected water and the movement of this equipment, into or between catchments**.** Such equipment may include fishing nets, waders and other angling equipment, boats, canoes and water craft. It is good practice to ensure all equipment is treated in a manner which helps to prevent the spread of disease when moving between any freshwater catchment, and especially when infected catchments have been visited.

Details of acceptable treatment methods are contained within the Scottish Government's advice leaflet "Home and Dry"

The MSS website contains a Code of Practice to help prevent the introduction of *G. salaris* into Scotland.

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For more information on disinfection procedures please refer to the disinfection guide available at www.MSS-scotland.gov.uk

Q6. Is there a risk to human health from eating fish either a) infested with *G. salaris* or b) from an area affected by *G. salaris*?

No. *G. salaris* is an external parasite which infests fish and only causes disease within Atlantic salmon populations. There are no known risks to human health from either eating fish infested with *G.salaris* or eating fish from a *G.salaris* infected zone. Food Standards Agency (Scotland) web site can be contacted for further advice on human health. (http://www.food.gov.uk/scotland)

Q7. Can I still access areas that are affected by *G. salaris*?

Yes. There will be no restrictions over the access of areas affected by *G. salaris*. Members of the public are requested to take all practical steps to help prevent the spread of the parasite and are requested to encourage others to do so where necessary.

Q8. Are there any effects upon pets (dogs, horses) accessing areas affected by *G. salaris*?

No. There is no scientific evidence to suggest that *G. salaris* posses any health risks to dogs, horses or any other terrestrial animals.

Q9. What should I do if I discover sick or dying fish at the river bank?

In the first instance please report the discovery to the Duty Inspector at MSS Marine Laboratory, Aberdeen. Tel: 01224 876 544, Fax 01224 295 620, email MS.fishhealth@scotland.gsi.gov.uk Advice will be provided regarding the collection and transportation of the fish to the laboratory for disease testing, as necessary. The relevant DSFB or Fisheries Trust could also be contacted (http://www.asfb.org.uk) and may be able to provide assistance in collection and transportation.

Q10. Can I access other areas after visiting an area infected with *G. salaris*?

Yes. Where the transfer of wet equipment – angling gear, waders, wellington boots, canoes, or boats is planned then please refer to the advice provided on reducing the potential spread of *G. salaris*. Anglers and water users are encouraged not to move between water catchments where at all possible, although there are currently no legal restrictions over such movements.

Q11. Can the parasite be observed by the naked eye, if so where will it be found on the fish?

G. salaris is small measuring just 1 mm in length and some 0.1mm in width, thus observation with the naked eye would be very difficult. The parasite will mainly infest the fins and gills of fish but may also be present over the body surface. Infection has been observed to be in higher densities over the fins and body, in comparison to the gills.

Q12. What are the signs or symptoms of gyrodactylosis?

Although *G. salaris* can infest all stages of freshwater salmonids and a number of non-salmonid freshwater fish species, the clinical signs of the disease gyrodactylosis, associated with *G. salaris*, are restricted to Atlantic salmon parr and smolt populations within freshwater environments. These include increased flashing, grey colouration of fish within the water column and white coloured, eroded fins. Infested fish will be prone to secondary bacterial and fungal infections.

Q13. What are the legal powers available to the Competent authority, Scottish Ministers and Regulators?

The Aquatic Animal Health (Scotland) Regulations 2009 give the Scottish Ministers powers to designate areas which are suspected or confirmed with respect to notifiable diseases. *G.salaris* is a notifiable disease and as such the current powers include the restriction of all movements of fish or gametes of fish along with feedstuffs for fish into and out of the designated areas without the permission of the Scottish Ministers.

The Aquatic Animal Health (Scotland) Regulations 2009 also provides additional powers in relation to the control of *G. salaris*. These include the power to:

- Apply chemical treatment;
- Impose standstill notices;

- Erect barriers and close fish passes;
- Authorise the removal of dead and dying fish from watercourses and fish farms for the eradication of *G. salaris*;
- Allow compulsory access;
- Clear fish farms; and
- Introduce mandatory disinfection of recreational equipment.

Q14. What bio-security measures can I take to protect my farm or fishery from *G. salaris*?

Increasing or maintaining a high level of bio-security on site will aid disease prevention.

Stock Source: By only sourcing stocks from certified disease free sources the risk of introducing *G. salaris* can be significantly reduced. All imports must meet the approval of the Additional Guarantees legislation covered under Commission Decision 2010/221/EU. All imports of salmonid eggs must be disinfected following import and before lay-out, in accordance with the current OIE guidelines.

Disinfection: The use of appropriate disinfectants for footbaths and general disinfection is encouraged, along with area and site specific clothing and equipment with disinfection facilities between each discrete area of the site. Disinfection facilities should be in place for all visitors to the site. All vehicles entering the site should be adequately cleaned and disinfected upon entry and exit to the fish farm.

Regular mortality collection and disposal should be made in an approved manner. The fallowing of ponds, cages and tanks along with cleaning and disinfection should be routine practice as part of a site management plan which highlights the need for sound bio-security.

Q15. What controls over imports are present to prevent *G. salaris* entering?

Great Britain is classified as a disease free zone with respect to *G. salaris*. Additional Guarantees, in Commission Decision 2010/221/EU provide protective measures against imports of infected fish. No susceptible fish species are permitted to enter the UK without the appropriate certification from the official authority

Q16 What is Rotenone?

Rotenone is a naturally occurring chemical which is obtained from the roots of tropical and sub tropical plants of the derris species. Rotenone has insecticidal, acaricidal and piscicidal properties and as a result, the chemical has been used as a pesticide and piscicide for a number of years.

Q17. Can I still access areas that are undergoing treatment for *G. salaris*?

There will be no restrictions regarding the access to areas undergoing treatment. Treatments involving the use of aluminium sulphate involve the use of concentrated sulphuric acid in large volumes. The public are strongly advised not to access these areas and not to partake in any leisure pursuits that involve access to the water as rotenone and sulphuric acid can be harmful and toxic to humans and animals.

Q18. Is there any impact upon human or animal health during or following a rotenone treatment?

Rotenone can be toxic to both humans and animals in high concentrations or doses. The level at which Rotenone will be applied to treat an infected river catchment is not thought to pose a risk to human or animal health. However, it is advisable to stay out of and away from the water and river bank during and following a rotenone treatment until you have been advised that it is safe to return.

Q19. Can I drink the water during a treatment / following a treatment of rotenone?

Scottish Water will advise of any restrictions or precautions to be taken in connection with the public drinking water supply. They will notify consumers when any such restrictions are lifted. Local authorities will liaise with users of private water supplies in the affected area.

Annex 6b. Recording and Logging Responses to Questions and Queries

Record form for dealing with queries in relation to *G. salaris* suspected or confirmed outbreak

File: Q+A brief.

Please complete all sections relevant and detail response given before filing.

Enquiry From

Organisation

Address:

Tel No: Fax No: Email:

Date Received: Date of response:

Detail Nature of Enquiry

Advice Given:

Annex 7. - List of SOPs cited within the Operations Manual

Movement Restrictions

FHI Admin 016 – Assessment of applications for permission to move live fish, eggs or gametes subject to movement restrictions.
FHI Admin 024 – Serving and revoking movement restrictions

Diagnosis

Mol–gen 001 – Flexible Scope; Sample Preparation and Reception in Molecular Genetics
Mol-gen 060 – Gyrodactylus morphological examination and dissection
Mol-gen 061 – Gyrodactylus PCR
Mol-gen 062 – Gyrodactylus RFLP
Mol-gen 063 – Gyrodactylus electrophoresis
Mol-gen 065 – *Gyrodactylus* purification and precipitation
Mol-gen 066 – *Gyrodactylus* CO1 PCR
Mol-gen 068 – *Gyrodactylus* identification using morphological features
Mol-gen 071– Flexible scope: QPCR Amplification and detection from cDNA/DNA (procedure not yet accredited)
Mol-gen 102 – Flexible Scope: Preparation of reagents in molecular genetics
Mol-gen 028 – Operation of Beckman Sequencer

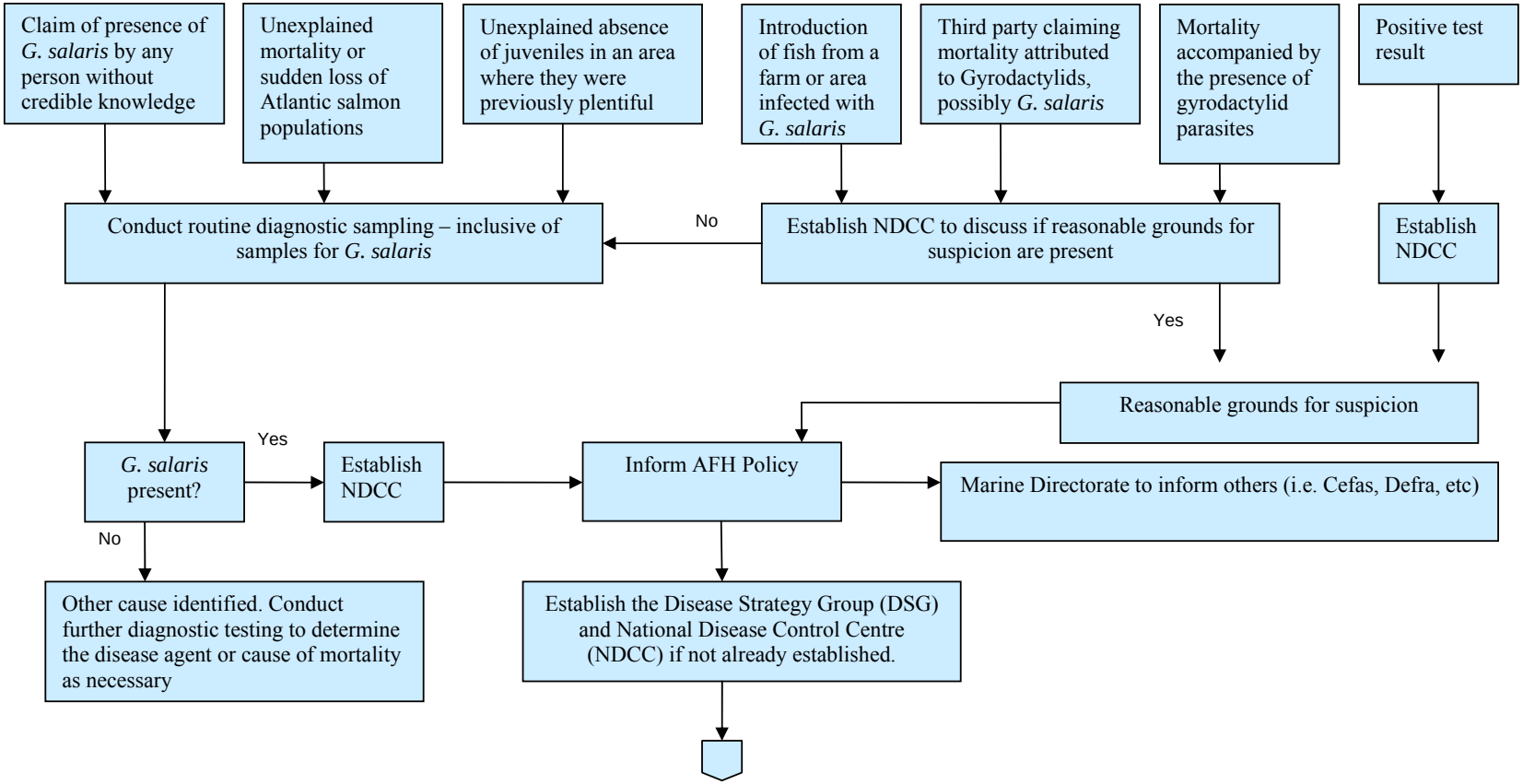
Sampling and Field Investigations

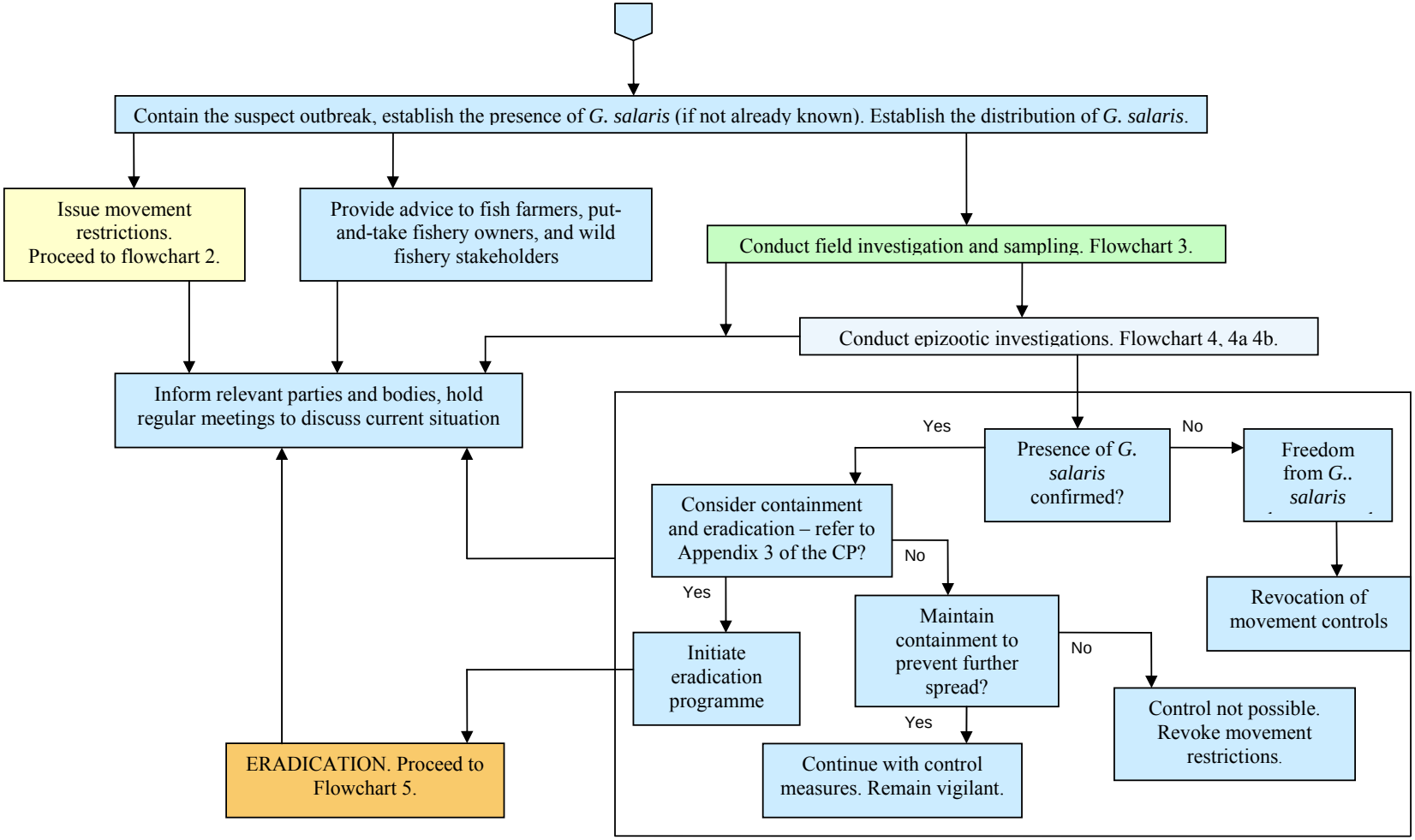
FHI Field 001 – Fish and shellfish farm site visit preparations
FHI Field 002 – Checking site records and completing case paperwork
FHI Field 011 – Transport of fish tissue and shellfish samples collected on site
FHI Field 028 – Selection of fish on site for sampling for diseases in accordance with 2006/88/EC
FHI Field 029 – Disinfection of protective clothing, boots and equipment on site
FHI Field 040 – Inspection of fish on site
FHI Field 045 – Collection of Gyrodactylus *salaris* samples from fish
FHI Field 046 – Procedures for electro-fishing
FHI Field 047 – Procedures for setting gill netting

FHI Met 001-Method of sampling fish for fish disease in accordance with 2006/88/EC
FHI Met 004 – Method of inspection of fish farm sites for fish disease in accordance with 2006/88/EC

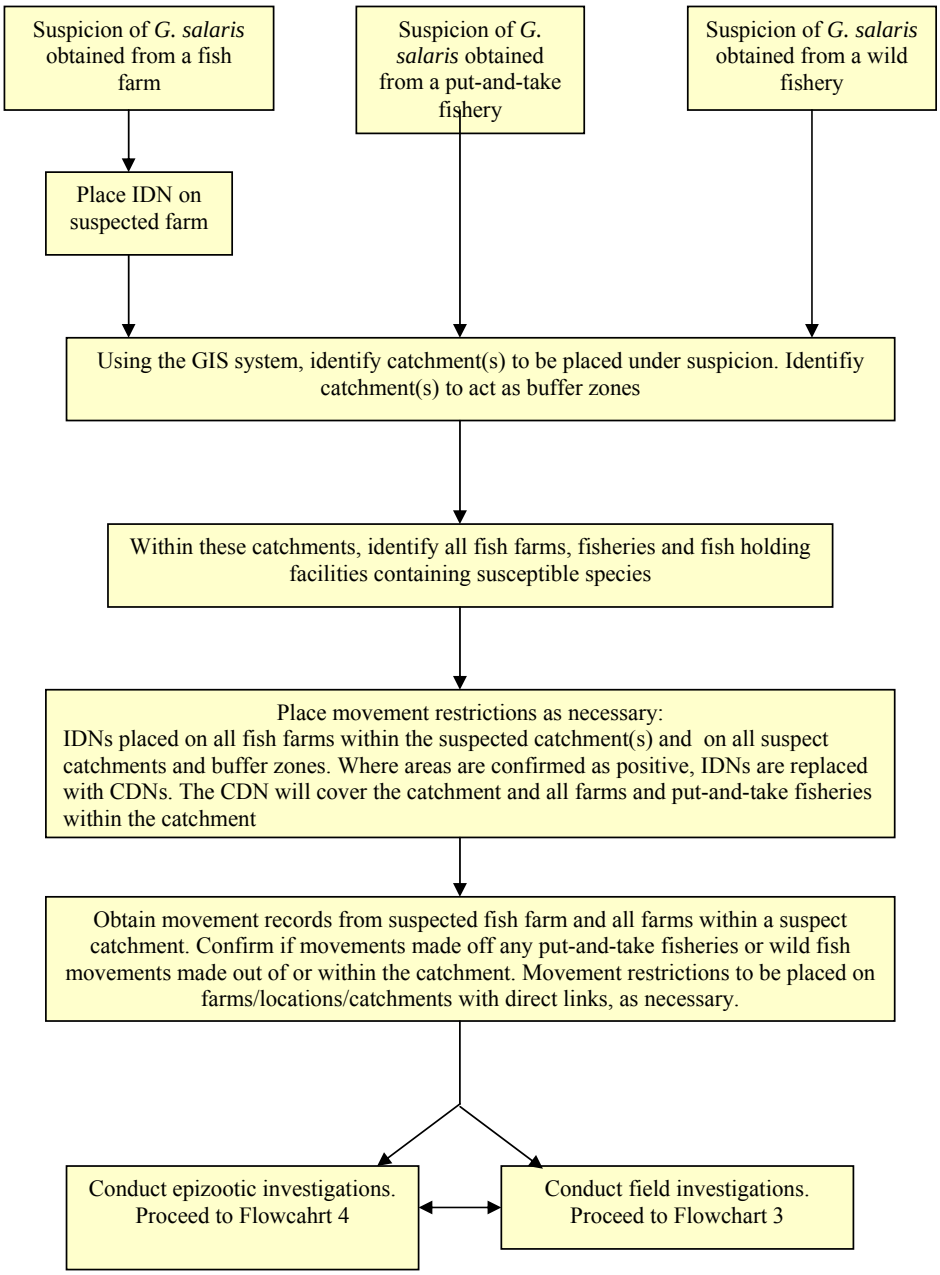
FHI Admin 004 – Logging in cases
FHI Admin 005 – Unpacking and distribution of incoming samples and completion of condition of samples on receipt forms
FHI Admin 017 – FHI training programme

Flowchart 1. Overview of procedures in relation to suspicion and confirmation of *G.salaris*

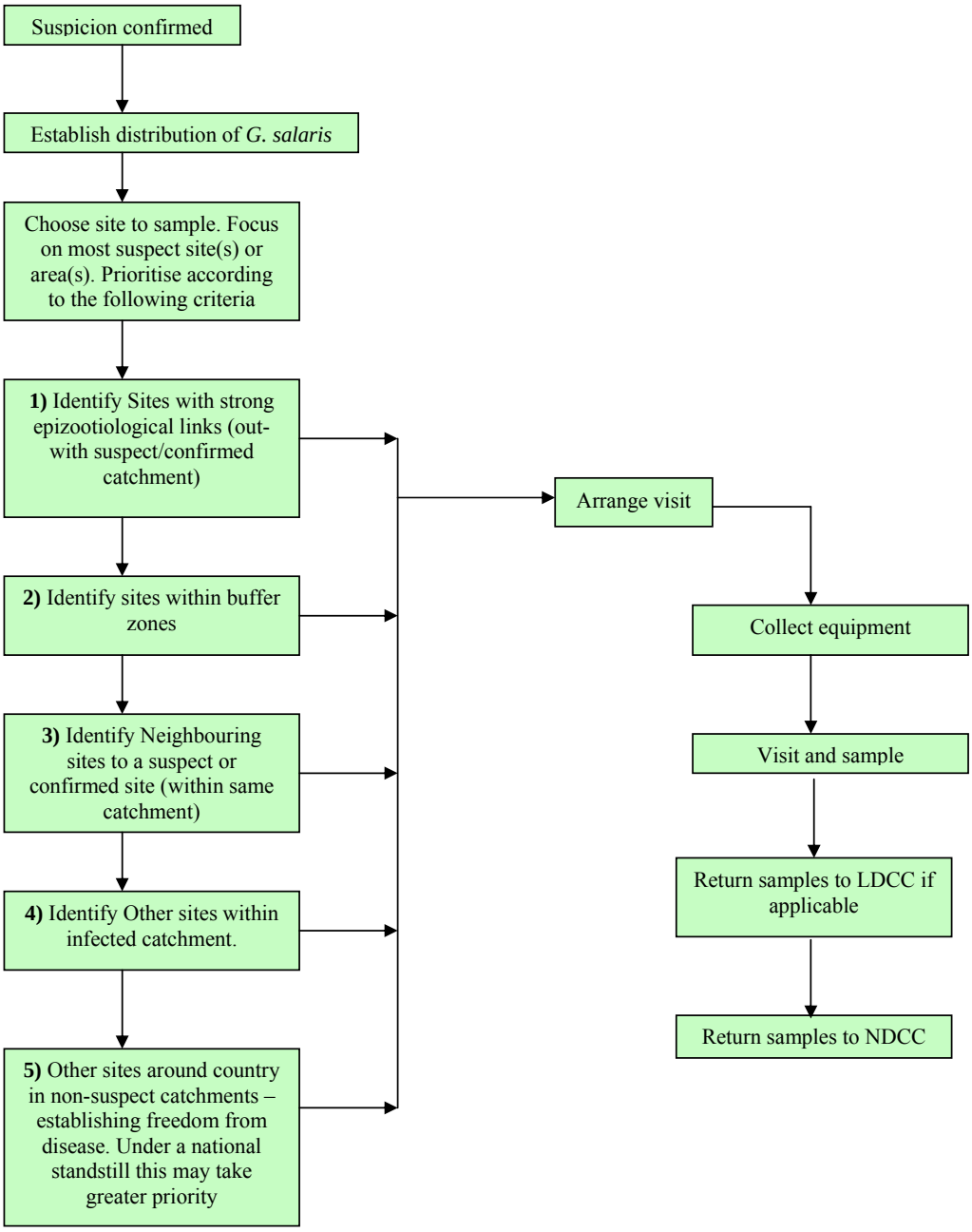



Contain the suspect outbreak, establish the presence of G. salaris (if not already known). Establish the distribution of G. salaris.
Issue movement restrictions. Proceed to flowchart 2.
Provide advice to fish farmers, put-and-take fishery owners, and wild fishery stakeholders
Conduct field investigation and sampling. Flowchart 3.
Conduct epizootic investigations. Flowchart 4, 4a 4b.
Inform relevant parties and bodies, hold regular meetings to discuss current situation
Yes
Presence of G. salaris confirmed?
No
Freedom from G.. salaris
Consider containment and eradication – refer to Appendix 3 of the CP?
No
Yes
Revocation of movement controls
Initiate eradication programme
Maintain containment to prevent further spread?
No
Yes
Control not possible. Revoke movement restrictions.
Continue with control measures. Remain vigilant.
ERADICATION. Proceed to Flowchart 5.

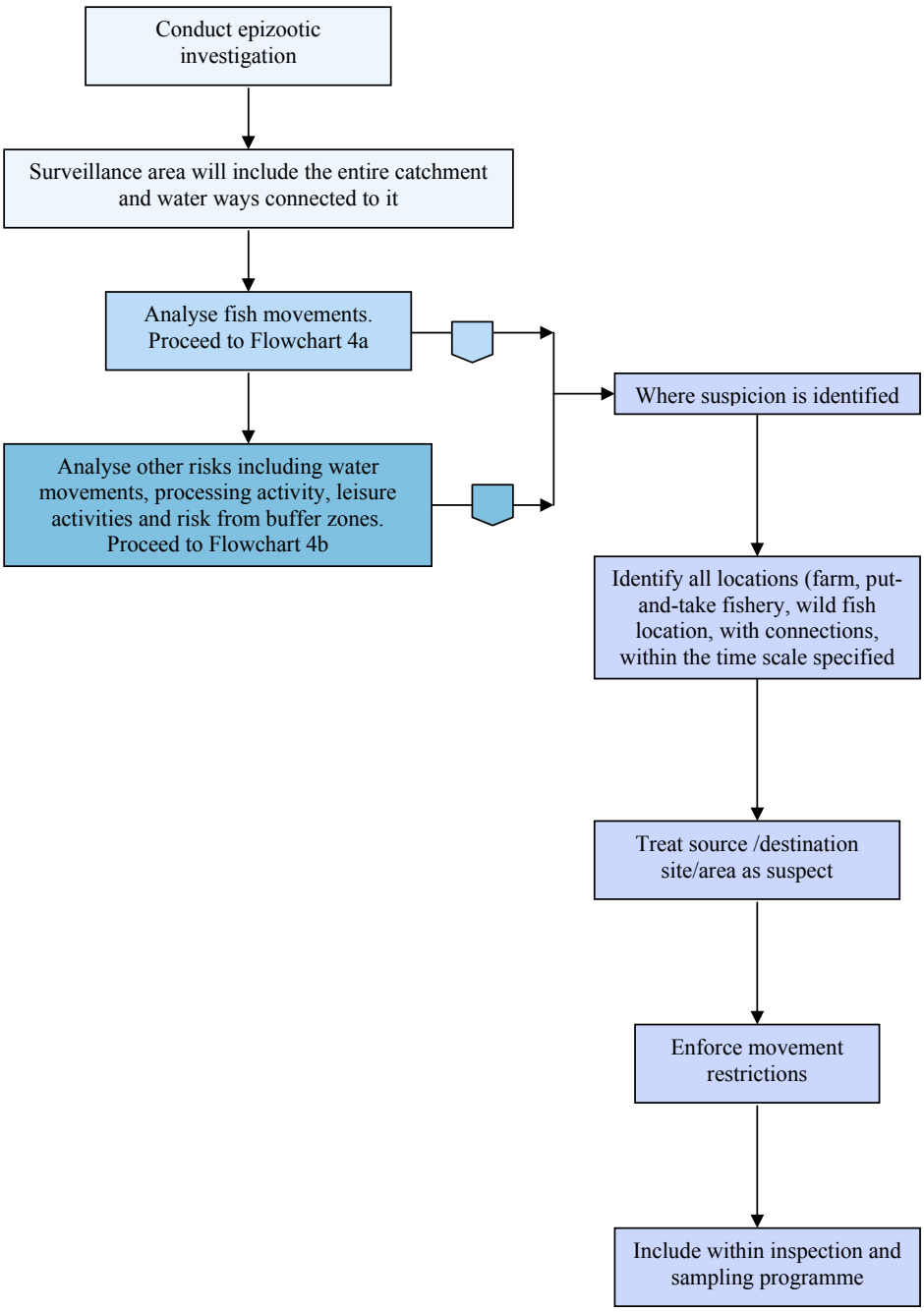
Flowchart 2. Placing movement restrictions on suspect sites



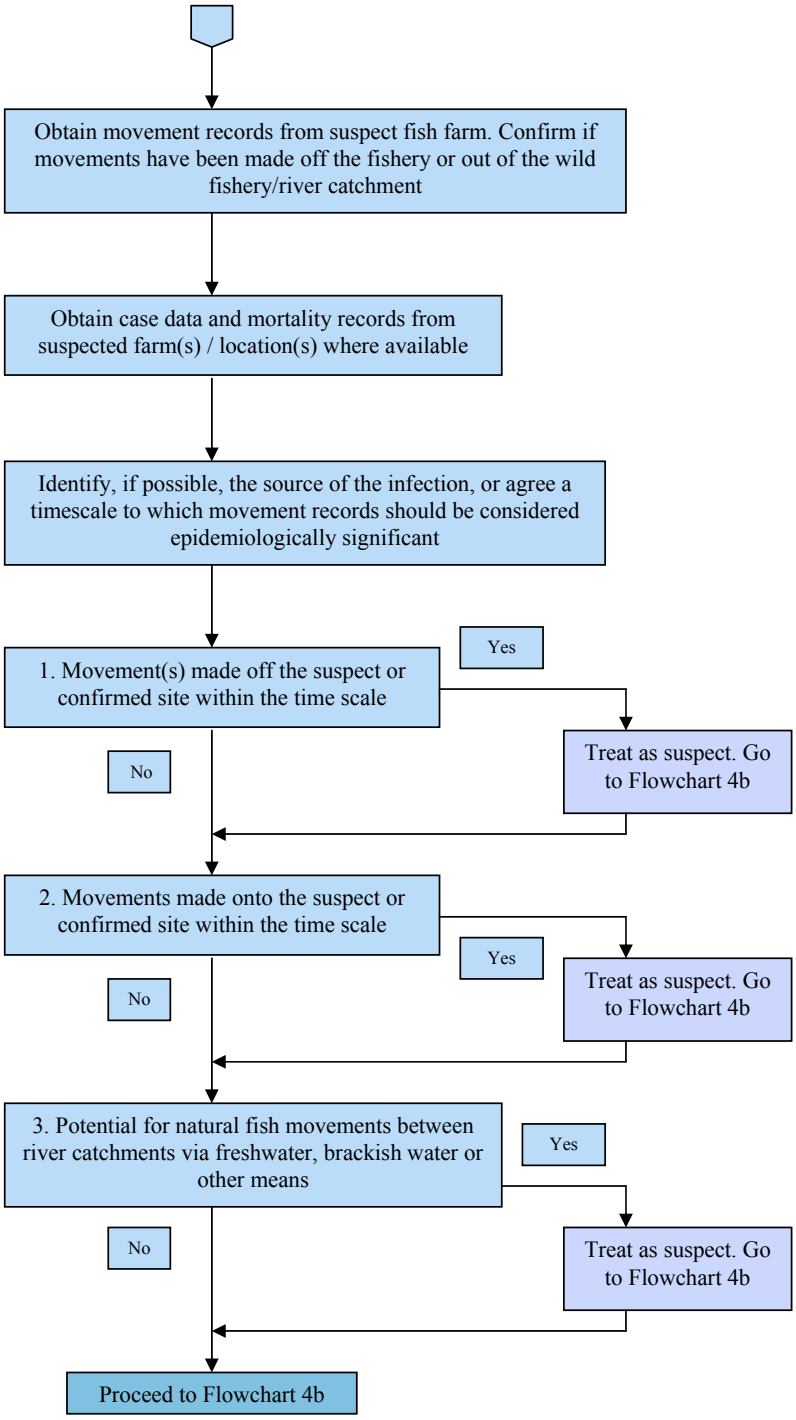
Flowchart 3. Procedures for sampling Sites



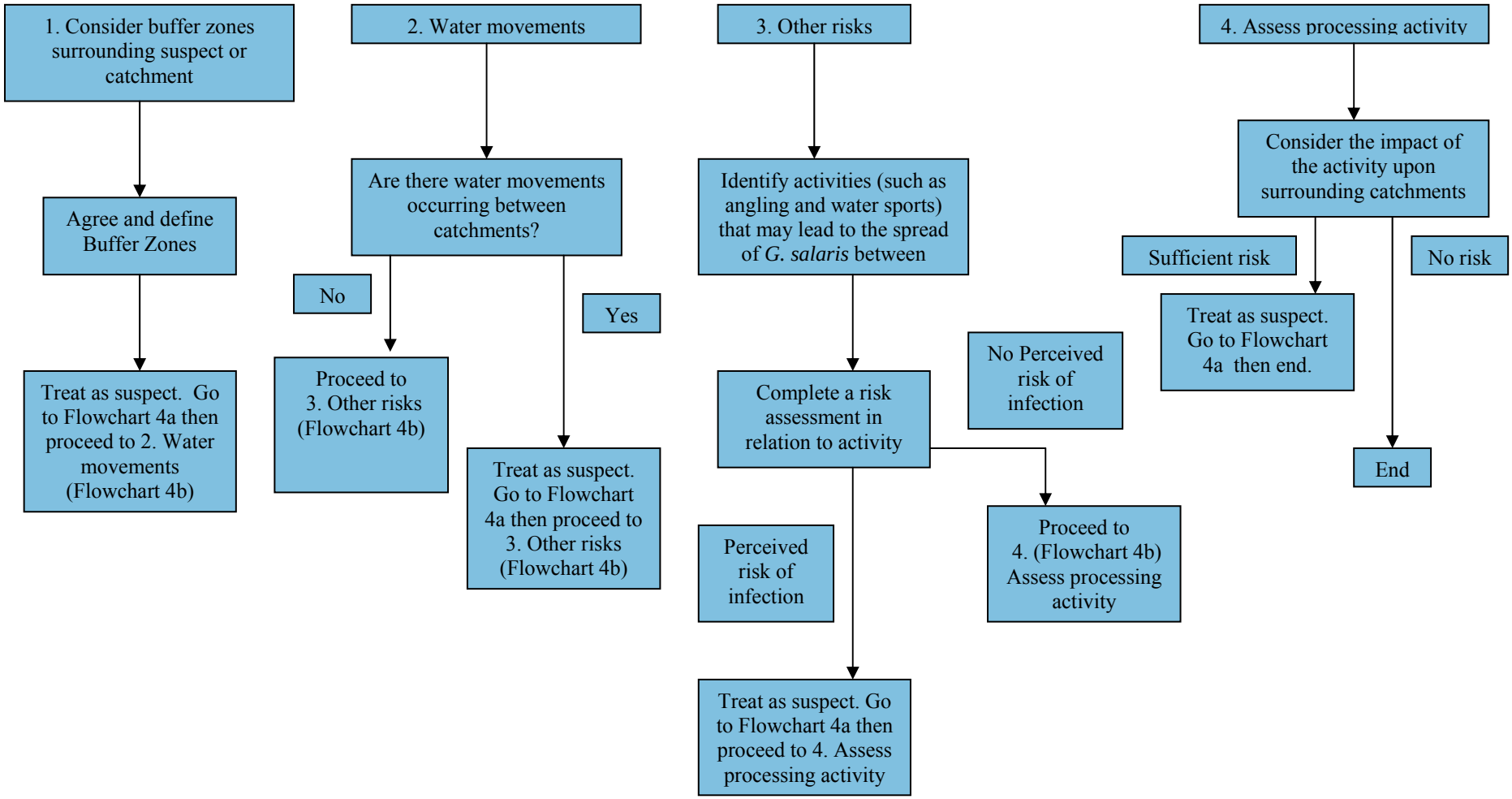
Flowchart 4. Epizootic investigations – Overview



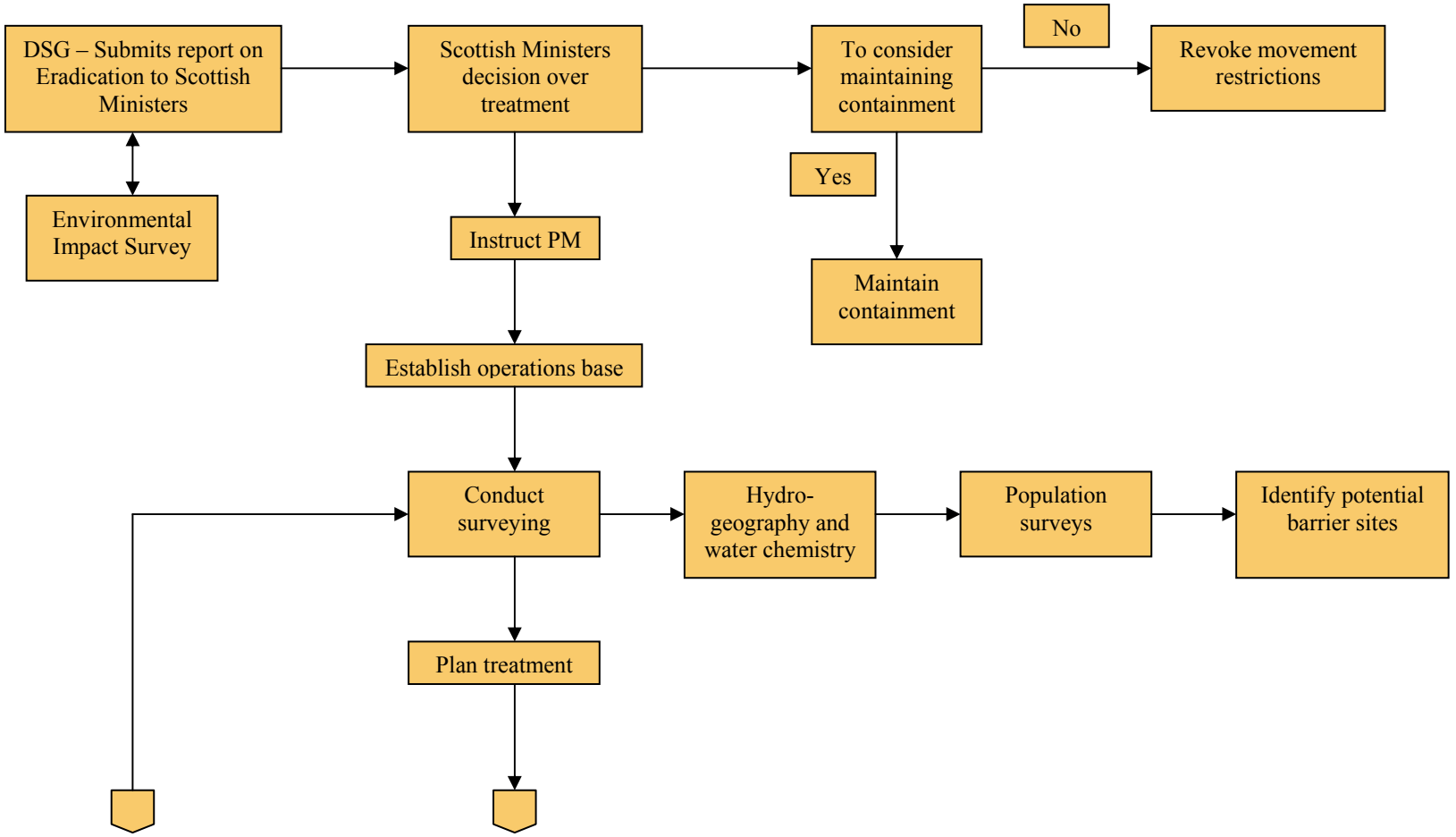
Flowchart 4a. Epizootic investigations - Live Fish Movements

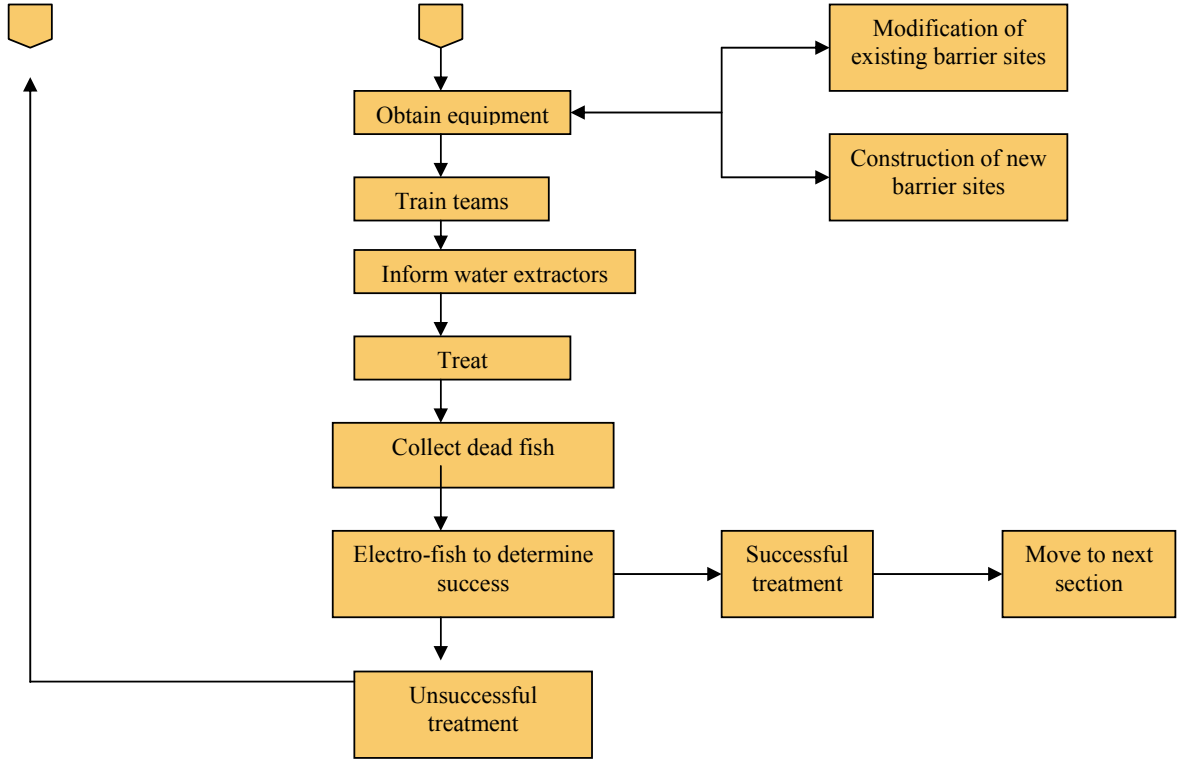


Flowchart 4b. Epizootic investigations– Other risks



Flowchart 5. Eradication




Modification of existing barrier sites
Obtain equipment
Construction of new barrier sites
Train teams
Inform water extractors
Treat
Collect dead fish
Electro-fish to determine success
Successful treatment
Move to next section
Unsuccessful treatment

APPENDIX 12 TEMPLATE FOR TREATMENT OF A NORWEGIAN RIVER

THIS TEMPLATE IS BASED ON THE TREATMENT OF THE RIVERS AROUND STEINKJER IN 2008. WHEN THIS TEMPLATE IS USED TO DEVELOP A TREATMENT PLAN FOR A SCOTTISH RIVER CARE MUST BE TAKEN TO ENSURE THAT THE PLAN COMPLIES WITH ANY EUROPEAN, UNITED KINGDOM AND SCOTTISH LEGISLATION AT THE TIME OF PREPARATION.

1. SAFETY, RESPONSIBILITY, AUTHORITY AND BEHAVIOUR DURING THE ROTENONE-TREATMENT IN THE STEINKJER REGION 2008.

1.1 By following the established safety routines as described in 'Safety regulations for fieldwork" prepared by the Administrative Director of the region, the lives and health of all participants will be safeguarded. Furthermore, the administration and allocation of the power of authority and a certain conduct with regard to the work to be carried out will ensure that the treatment will be carried out in the best possible way.

THE SAFETY REGULATIONS AS STATED IN THIS DOCUMENT CONCERNS ALL PROJECT ACTIVITIES!

2. DIVISION OF LABOUR

2.1 The Regional Administration's Department of Environment for Nord-Trøndelag has the overall responsibility for initiatives against *Gyrodactylus salaris* within Nord-Trøndelag, while the Veterinary College (VI) is responsible for carrying out the Rotenone-treatment as commissioned by Direktoratet for Naturforvaltning (DN) [*Nature conservancy body*]. A steering group has been established who will make the core decisions with regard to initiatives against *Gyrodactylus salaris* in the Steinkjer region.

2.2 The Steering group consists of the following people: Svein Karlsen, Administrative Leader for Nord-Trøndelag, Jarle Steinkjer, Nature Conservancy Directorate and Knut Rønningen, Inspectorate for foods.

2.3 The operational management is responsible for the practical co-ordination of the various tasks to be carried out in the course of the Rotenone-treatment. They will be based at Headquarters and must be in communication with all teams. The Operational management consist of the following people from VI: Asle Moen and Roar Sandodden. The contact between the operational management and the participants should preferably be channelled through the team leader.

2.4 The participants are split into teams and the **team leader,** as the person in charge for each team, is responsible for:

1. Organising the crew in a purposeful and efficient manner.
2. Notifying in the case of problems or if there is a lack of manpower or time.
3. Notifying the management when the work starts and when it finishes.
4. Participating in the daily meetings at the end of each working day to report on the work carried out for that day and participate in the planning of the following day.
5. Fetching and delivering necessary equipment.

6. Ensuring that the team are following the work schedule and complying with the safety rules and that the team is equipped with all necessary safety equipment.
7. Ensuring that all team members will disinfect equipment and that they are drying the clothes after work within a contaminated area.

2.5 The person responsible for **Transmission hygiene** is Ole Moxness from the Food Inspectorate. All established rules with regard to contamination risks must be adhered to. The danger of contamination is first of all linked to dead fish and equipment that has been in contact with river or wild fish stock. Dead fish are transported to a special reception area; the fish will be tested at this location prior to being destroyed in a sound manner. The reception area has been constructed so that the risk of transmitting the decease is minimal. Equipment to be disinfected will be dealt with by trained staff at the fish reception area.

2.6 Person responsible for the handling of fish
Rune Undersaker is the person responsible for organising the work at the fish reception area and the laboratory. Bjørn Bjøru (VI) will be responsible for the safekeeping of the trout and salmon stocks prior to the initiative.

3. **CREW SAFETY**

3.1 **FIELD WORK AND THE USE OF BOATS**

3.1.1 The project participants should never work alone in areas, which are deemed to have risk elements (working from a boat, rivers in spate, rock faces etc.). Life jackets must be worn when working from a boat, and the boat must be secured with rope if necessary. Life jackets should also be used when working in deep waters and/or fast flowing water or when working in rivers even if a boat is not used (for example, when wading).

3.1.2 Diving with the use of oxygen should be carried out according to the diving guidelines (Arbeidstilsynet [*Inspectorate for health at work*] January 1991). Only Divers with an approved diving certificate must undertake diving. Crew moving in water (swimming, wading etc.) must always be followed by a lifeguard ashore or in a boat and a safety rope should connect the person on land with the person in the water.

3.1.3 No task should be carried out, which is deemed to be risky without informing the operational management and being approved by them. The operational management will organise reserve crews in order to achieve optimum safety. Therefore, it is important to notify in case assistance is required.

3.2 Traffic
Be careful in traffic! Drive looking at the road and not the river. Adhere to the speed limits! We are working in places where the level of traffic varies. Our activity in some areas will increase the number of vehicles using the road by more than 100% - keep this in mind and remember that others using the roads may not know of our activity. Parking can be difficult in places – avoid parking dangerously. It may be necessary to work on/by the roadside. Be alert and careful, and follow traffic rules also as a pedestrian. Use common sense and don't take any necessary chances.

3.3 PERSONAL INJURIES

Any personal injuries must be notified to the operational management immediately. In the case of serious injuries, the injury should be dealt with as much as is possible, phone the emergency number and then the operational management should be informed.

Everyone working for the government is covered by the government accident insurance.

3.4 CFT-Legumin (Rotenone)

3.4.1 Concentrated CFT-Legumin should not come in contact with skin and eyes and it should not be inhaled. Use safety gloves when handling the substance and replace these if they are damaged in any way or if the substance gets into the inside of the glove. All staff handling CFT-Legumin will be offered a face/gasmask and safety glasses. In area indoors used for replenishing or dispensing the chemical, the gasmasks provided MUST be used when handling the concentrated formula.

3.4.2 In its diluted form the substance is deemed to be harmless, but we would nevertheless encourage participants to use gloves and the available safety equipment just to be sure. Do not eat, drink or smoke during the Rotenone-treatment. Wash your hands before touching food etc. and always at the end of a working day.

3.4.3 Empty Rotenone-containers and watering cans should daily be thoroughly cleaned in the river. Unused remains of the substance should be handed in at the end of the working day. All participants must read the CFT-Legumin information attached to this document.

4. WORK SCHEDULE

4.1 Everyone will be handed a work order. This must be adhered to! The marked areas of the map must be found and treated in a thorough and responsible manner. This means that the team must ensure that the area indicated must be treated with a sufficient amount of Rotenone over a sufficient amount of time. If unsure whether an area is adequately treated, the operational management should be contacted. New situations must be closely assessed and any departure from the work order should be discussed with the operational management. The team leader shall make a report of all work at the end of the day.

4.2 Do not add Rotenone to areas (Pools, water holes, wells etc) not stated in the work order until this has been discussed with and approved by the operational management.

4.3 Be considerate towards the cultural landscape and private property.

5. COMMUNICATION

5.1 Every team will be handed a VHF-sender and the team leader must learn to use this. All teams must also be equipped with a mobile phone. VHF-units used for dispensing crews will be set to one frequency - fish pickers may use another.

5.2 It is important that communications discipline is observed. The communication network should only be used when necessary and casual chat should be avoided. Please also keep in mind that the battery capacity is limited. The team leader is responsible for

recharging their team-VHF at the end of every day. It will be possible to communicate between the teams as well as between teams and management. If a team looses contact with the management or other teams, it is possible to communicate via a third team or by a mobile telephone. However, the mobile phone should primarily be used to communicate with the operational management if the VHF cannot be applied. This is so that all communication is open and can be logged.

6. CONDUCT IN RELATION TO THE MEDIA

6.1 When asked by the media the participants can explain the task they are set. Show approachability, but do not answer any questions with regard to strategy, any technical questions or "in your opinion…" etc. All questions not related to the task in hand must be referred to the operational management. This also applies to questions from the general public. Immediately report all strange conditions, activities and questions to the operational management. NB! Requests for photos should be refused!

Annex 1 Safety regulations for fieldwork

1. **OBJECTIVE**

1.1. The rules and practical advice has been prepared in order to ensure the safety and security of the employee during the work.
1.2. The rules only apply during the employee's working hours and thus not for any leisure time. During fieldwork the working hours can cover 24 hours.

2. **IMPLEMENTATION**

2.1 The employee must help implement the actions described in the safety regulations and adhere to these as stated in any Risk Assessment prepared for the work detailed in this treatment plan
2.2 The employee must during the work show common sense and not take unnecessary risks.
2.3 The employer is responsible for the availability of all necessary protective and safety equipment.
2.4 The employer must ensure that the employees are informed of accident and health risks in connection with the work undertaken and that they are given the necessary training.

3 **INITIATIVES**

3.1 During fieldwork and work outside the usual place of work, the employees must keep their department informed of residence, address, contact person (see item 3.2.2.) and a possible phone number.
3.2.1 The employee should always work with a companion in difficult or rough terrain and in remote areas. Suitable means of communication must be brought along.

3.2.2. The employee should inform a work colleague or another contact person of:

- Where he/she is
- What kind of work is to be carried out
- Estimated return time

In case of any change of plans, this should be notified the contact person as soon as possible.

The department should always be kept informed of who the contact person is.

3.3. During fieldwork, if necessary, the employee should be equipped with first aid kit and distress rockets. The employer is responsible for any necessary training in the supplied equipment. The employer is responsible for checking the equipment prior to the start of the fieldwork.
3.4. When renting/using a boat the employee must ensure that the boat is sound and that all necessary safety and rescue equipment is on board.
3.5. The employee must not be alone in a moving boat, unless he/she is equipped with a dead man's handle and it is possible to board the boat from the water. When

using a smaller boat a life jacket, flotation suit or similar must be used in certain conditions. High visibility clothing should be used, preferably orange coloured.

3.6. The employee should avoid working on thin ice. If it is necessary to step onto thin ice, a flotation jacket, ice prods and rescue rope secured to a person on land, in a boat or thick ice should be used. Always have a companion during such work. A backpack or similar must have quick release fasteners or be carried in such a way that it can easily be removed.

3.7. During work in fast flowing streams or rivers flotation jackets, flotation suits and/or rescue ropes must be used during inclement conditions. This also applies to work on the foreshore when the terrain is rough or in stormy weather. Always have a companion present during such work. A backpack or similar must have quick release fasteners or be carried in such a way that it can easily be removed.

3.8. For work alongside a busy road necessary warning and safety equipment should be used.

3.9. For work on floating or fixed installations at sea or in fresh water (for example, fish farms) flotation jackets, flotation suits or similar should be used during inclement conditions. High visibility clothing should be used, preferably orange coloured. Always have a companion present during such work.

3.10. The employee should not enter rooms or areas with a risk of poisonous gasses or where lack of oxygen may occur. If work has to be carried out under such conditions breathing apparatus must be used. If it is necessary to enter a room where oxygen starvation may occur (for example, a silo) breathing apparatus with a separate air supply must be used.

3.11. For work on building sites, development areas, industrial areas or other places where damage to the head can occur, a helmet must be used. Where a danger of damage to lower limbs occurs safety shoes must be worn. Whenever there is a need for further safety equipment this must be used.

3.12. In the case of diving in connection with the work, this must be done according to the safety regulations as set out by the Health and Safety Directorate. Permission from the employer and safety officer must be obtained prior to diving. It is the employer's responsibility to ensure that diving can be carried out in a way, which will satisfy the health and safety directorate requirements with regard to approval and training.

3.13. When working with hazardous chemicals the manufacturers'/importers' guidelines must be followed. Always use the recommended protective equipment. Chemicals not registered in the Regional Administration's Register of substances must not be used.

3.14. For hill climbing and climbing large trees, approved climbing gear must be used. Always have a companion present during such work.

4. OTHER REGULATIONS

4.1 If deemed necessary the safety officer can, in order to ensure the safety of the employee, stop the work. The safety officer must also provide additional or adjusted regulations to the above in order to suit the local conditions. Such additions and/or adjustments should be sent to the main safety officer and AMU for approval.

4.2 The employee working in the field should be equipped with suitable ID from the Regional Administration of Nord-Trøndelag.

COMMENTS TO THE SAFETY REGULATION

3.2.2| The reason behind such notification is that the contact person must be able to evaluate if an accident has happened or if it is necessary to report the employee missing so that a search can be launched. The contact person can therefore be a family member etc. If, for example, 2 or more employees are working away from each other in the same area it is only logical that they operate as contact persons to each other.

2.4 The employer must ensure that necessary training has been given. Here the departmental leader, section leader or group leader can also be considered as the employer in as much as he/she is acting on behalf of the employer. The employee is also responsible for receiving such training.

3.3 The minimum requirement for first aid equipment is plasters, bandages, sterile compresses and a compact first aid kit. Individual requirements due to allergies etc should be individually assessed. All employees working in the field has received/can receive first aid equipment. Signal flares and cartridges will be lent upon request to the safety officer.

3.6/3.7 Backpack, a frame for fishing gear or similar must have a quick release buckles in order to enable the user to remove this equipment easily. It must be possible to operate the quick-release buckle with one hand (both the right and the left). If the equipment does not have a quick release buckle it must be carried in such a way that it is easy to remove it without having to unbuckle it etc.

Waist belts must therefore not be used.

3.14 For diving, the regulations of 1975 so far apply.
"Commercial diving with light equipment and air supply". (Ord.nr. 213 e). These regulations are currently being revised and new regulations are expected soon.

3.15Cf. regulations for the law on working environment (1983): "Product data sheet and register of substances" (Ord.nr. 445). A copy of the Regional Administration's Register of substances should be kept with the main safety officer.

Annex 2 SAFETY DATA SHEET

1. IDENTIFICATION OF SUBSTANCE/PRODUCT AND COMPANY

IDENTIFICATION OF SUBSTANCE/PRODUCT

Product name: CFT Legumin

Plain text: Biocide, piscicide.

IDENTIFICATION OF COMPANY:

InterAgro AB

Navröds Gård

SE-270 35 Blentarp, Sweden
Ph: +46 (0) 416 16002 Fax: 16004
E-mail: interagro@interagro.seComp no.: 556305-2264

2. HAZARDOUS ELEMENTS

CAS number or other code	Chemical name	Conc.	Warning symbol, R-text or other information
83-79-4	Rotenone	2.5 %	T, N, R 25-36/37/38-50/53 EU nr. 2015019
51-03-6	Piperonyl butoxide	2.5 %	N, R 51-53 EU nr.200-076-7
872-50-4	N-methyl-2-pyrrolidone	10 %	Xi, R36/38 EU nr. 212-928-1

3 IDENTIFICATION OF HAZARDOUS RISK

Toxic if inhaled or swallowed. Irritating to eyes, airways and skin. Dangerous to aquatic organisms.

4. FIRST AID ADDITIONAL INFORMATION

INHALATION

Leave the area, where you have been exposed and lie down. Supply oxygen or artificial respiration. Seek medical help.

SKIN CONTACT

Rinse the skin immediately with soap and plenty of water. Remove all soiled clothes and shoes.

EYE CONTACT

Flush thoroughly with plenty of water for at least 15 minutes and contact a doctor. Seek medical help.

IF SWALLOWED

Do not attempt to regurgitation. Seek medical help.

INFORMATION FOR THE DOCTOR OR FIRST AIDERS

Contains Petroleum Distillates

5. IN CASE OF FIRE

SUITABLE EQUIPMENT FOR FIRE FIGHTING

Alcohol resistant foam, water spray, dry chemicals, carbon dioxide. Cool down the Tanker/container with water.

SPECIFIC DANGER IN CASE OF FIRE

Can release dangerous gasses. Contaminated water used to extinguish the fire must be collected separately. It must not enter any drains.

SPECIFIC PROTECTION FOR FIRE-FIGHTERS

In case of fire, use self-contained breathing apparatus.

6. IN CASE OF OUT OF CONTROL SPILLAGE

PERSONAL PRECAUTIONS

Use protective clothing Avoid contact with skin and eyes. Do not inhale the aerosol spray and/or gasses. In the case of fire self-contained breathing apparatus should be used.

ENVIRONMENTAL PRECAUTIONS

Avoid the product entering drains. Avoid the product entering ground water or surface water

CLEANING METHODS

Use an inactive material to absorb the substance and dispose of it as a dangerous material.

7. HANDLING AND STORAGE

HANDLING

Use protective equipment

STORAGE

Ensure that the containers are tightly closed and placed in a dry, cool and well-ventilated area. Take necessary precautions in order to avoid static electricity (which can light organic gasses). Store in the original packaging.

8. EXPOSURE CONTROL/ PERSONAL PROTECTION

Exposure limits

Rotenone:

RTF (8 h) = 5 mg/m^3 (Finland 2002)

RTF (15 min) = 10 mg/^{3} (Finland 2002)

TWA = 5 mg/m^3 (USA)

N-methyl-pyrrolidone

HTP (8 h) = 25 ppm (Finland 2002)

RTF (15 min) = 100 mg/m^3 (Finland 2002)

NGV = 50 ppm, 200 mg/m^3 (Sweden)

NGV = 75 ppm, 300 mg/m^3 (Sweden)

EXPOSURE CONTROL

COMMERCIAL EXPOSURE CONTROL

Should be handled according to good industrial hygiene practice and safety routines. Avoid contact with skin and eyes. Do not inhale gasses/aerosol spray. Wash your hands prior to breaks and immediately after handling the product.

PROTECTION OF AIRWAYS.

Use breathing apparatus with combination filter for gasses/particles (A/P2)

PROTECTION OF HANDS

Butylene rubber gloves Penetration time for *N-methyl-pyrrolidone* > 8 hours

PROTECTION OF EYES

Tight fitting safety glasses. A bottle of purified water to use as eyewash.

PROTECTION OF SKIN AND BODY

Protective clothing, boots, rubber or plastic apron. Emergency shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information (appearance and smell). Liquid, brown, very weak

Important safety information for health and the environment:

pH	3.3 (5 % solution)
Boiling point/area	No data available
Autoignition temperature	Approx. 80°C
Explosive properties	
Min. explosion limit	No data available
Max. explosion limit	No data available
Gas pressure	No data available
Relative density	Approx. 1020 kg/m3
Solubility	
Solubility:	
Water solubility	emulsifying
Fat solubility (solvent must be specified)	Not determined
Distribution coefficient (n-octanol/water)	No data available
Viscosity	Approx. 15 mPas
Other information:	Melting point approx. -20°C

10. STABILITY AND REACTIVITY

Conditions to avoid

High temperatures

MATERIALS TO AVOID

Strong acids and bases, oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

No data available

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Cubic extract (Rotenone 32 – 45 % and other resins 32 – 44 %):

LD50/orally/rat = 27.2 mg/kg

LD50/skin/rat > 3020 mg/kg

LC50/inhalation/4 hours /rat = 0.0107 mg/l

LC50/inhalation/4 hours /rat = 0.00592 mg/l

The material is irritating to mucous membranes if inhaled. Danger of serious lung damage if inhaled.

ADI 25 microgramme/kg body weight.

IRRITATION AND CORROSION

Irritant. Inhaling of a high concentration of gasses can damage lungs and in the worst case scenario be lethal. Symptoms of exposure can be headaches, dizziness, tiredness, nausea and vomiting.

SENSITIVITY

Rotenone and N-methyl-pyrrolidone are not activators. No data available on other components.

SEMI-ACUTE, SEMI-CHRONIC AND PROLONGED TOXICITY

No data available

Human Experiences: the solution is irritating to the eyes. Product elements can be absorbed through the skin.

Further information

Prolonged or repetitive exposure can damage liver and kidneys. Anaemia.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY

Very toxic to fish.

Rotenone: Very toxic to fish and aquatic organisms

Piperonyl butoxide: Toxic to aquatic organisms.

TRANSPORTABILITY

No data available

CONSTANCY/DECOMPOSITION

Biological decomposition

The substance breaks down easily. BOD (10 days) 71 % ThoD.

Rotenon and Piperonyl-butoxide can lead to long-term adverse effects in the aquatic environment.

Bio accumulative potential

No data available

13. DISPOSAL

Handle as hazardous waste according to current national and local regulations and guidelines.

14 TRANSPORT INFORMATION

UN.nr.	2902
Packing group	III
Land transport:	
ADR/RID	6.1
Risk code ADR/RID	60/2902
marking	6.1
Product description	2902, Pesticide, liquid, toxic, n.o.s. (contains rotenone)
Sea transport	
IMDG	6.1
Technical name	PESTICIDE, LIQUID, TOXIC, N.O.S. (contains rotenone)
Packing group	III
Will pollute maritime environments	Yes
IMO-marking	6.1 and will pollute maritime environments
Air transport:	
ICAO/IATA	3
Technical name	Pesticide, liquid, toxic, n.o.s. (contains rotenone)
ICAO-marking	6.1

15. REGULATORY INFORMATION

The product has been classified and marked according to EU Directives

INFORMATION ON WARNING DECALS

LETTER CODE ON THE WARNING DECALS AND AN INDICATION OF DANGER WHEN PREPARING

T Toxic

INGREDIENTS TO BE NAMED ON WARNING DECALS

Rotenone

Piperonyl butoxide

N-methyl-pyrrolidone

R-PHRASES

RS 3/25 Toxic if inhaled or ingested

R36/37/38	Irritating to eyes, airways and skin

S-phrases

S26:	In case of contact with eyes, rinse thoroughly with plenty of water and contact a doctor.
S28:	In case of contact with skin: Rinse the skin immediately with plenty of water.
S38:	In case of inadequate ventilation: Use suitable breathing apparatus.
S36/37:	Use suitable protective clothing and gloves
S45:	In the case of accidents and if the person feels unwell: Seek medical advice immediately (If possible show the label to the doctor).

16. OTHER INFORMATION

TEXT FOR R-PHRASES AS MENTIONED IN CHAPTER 2

R25	Do not ingest. Toxic.
R36/38/	Irritating for eyes and skin
R36/37/38	Irritating to eyes, airways and skin
R50/53/	Very toxic to aquatic organisms and can cause long-term adverse effects in aquatic environments.
R53	Can cause long-term adverse effects in the aquatic environment.

OTHER INFORMATION

The information contained in this data sheet is believed to be correct at the time of publishing the datasheet. The information should be regarded as a guide for the safe handling, use, treatment, storage, disposal and emission and must not be considered to be a warranty or an itemisation of quality, as the conditions for use of the product is outwith our control. The information is only applicable to this material and may not apply if the material is used in combination with other materials or in other processes than those described in this text. InterAgro AS shall not be held liable for any loss or damage resulting from the use of this data, information or suggestions.

BIBLIOGRAHPY

Regulations, databases, literature and own testing.

Annex 3. Chemical treatment of the watercourses in Steinkjer and Beitstadfjord, Autumn 2008.

Supplementary to the background document/investigative report, and is a more detailed plan of what has to be carried out during treatment. For details with regard to the background and reasons, technical challenges with regard to the treatment etc., please see the explanations prepared for the application of release consent.

Content

1. BACKGROUND TO AND JUSTIFICATION FOR PROJECT

1.1 The objective is to remove the parasite throughout the whole of the infected region. An infected region is *'an area in which G.salaris can be found and geographically is limited to the ability of the parasite to spread in a natural way either on its own or through a host.'* The infected region can be limited to all rivers and streams running into the fjord system within the Skarnsundet, i.e. Beistadfjorden, Hjellbotn and Verrasundet. However, it is not impossible that it could also spread through the Skarnsundet to watercourses in the Trondheimsfjorden. It is deemed irrelevant for the current situation to do more than monitor these watercourses at present. This will be dealt with in other plans and will therefore not be mentioned in this report.

1.2 In order to control the parasite, it is necessary to concentrate on all the watercourses within the infected region either through chemical treatment or via intensive monitoring and alertness. Within the infected region, the parasite has been detected in the Steinkjer watercourse as well as in Figga and Lundelva. Many of the other smaller rivers in the fjord-system have been monitored without the parasite having been recorded. In total 80 streams and smaller rivers are running into Beitstadfjorden.

1.3 *G.salaris* was first recorded in the Steinkjer watercourse and Figga in 1980. In 1988 a fish barrier was constructed in Figga in order to reduce the anadromous stretch for this river. The barrier prevents the salmon going into 18 km of the river as well as the 20 km^2 lake Leksdalsvatnet and reduces the anadromous stretch to just under 2 km. The fish ladder at Støfossen in Ogna was also closed off, so that the salmon carrying stretch of this river was reduced from approx. 36 km to 18 km. The river Byaelva carries salmon for 3 km up to the hydroelectric plant at Byafossen. The main reaches of the rivers currently have a total anadromous stretch of approx. 23 km. Furthermore, the watercourses have long tributaries that also can contain salmon. Fish barriers have been constructed for the longest of these.

1.4 An attempt to eradicate the parasite from these watercourses by using CFT-Legumin (Rotenone) was carried out in 1993 and 2001-2002. 4 and 3 years after these treatments, respectively, the parasite has again been recorded. In 2005, treatment of Byaelva, Figga and the lower reaches of Ogna were again carried soon after it had been recorded again. This treatment was primarily to limit infection. The parasite was recorded in stretches of Ogna above the treatment area in the same year. In 2006 another infection limitation treatment of the watercourses was carried out. This time acid aluminium was the main chemical and CFT-Legumin (Rotenone) was a supplement. The parasite was recorded after the treatment in Rølla, a tributary to Ogna. The infection was clearly reduced in the watercourse after treatment, and was only recorded again in the summer of 2007. At the start of the treatment it had spread to several places downstream from Rølla.

1.5 The treatment in 2007 was not carried out according to plan and cannot be seen as a full-scale treatment. Fish kept in vessels at Ogna was *Gyro*-infected during clean up after the treatment. These vessels had a water inlet directly from the river and should have been treated at the same level as the fish in the rivers. For further information please see the annual report for Steinkjer. *Gyro* was not found in the watercourses right after the treatment, but in samples collected between 5th and 6th of June 2008 *G.salaris* was again recorded in areas of Ogna.

1.6 From the treatments in Steinkjer in 2006 and 2007 and the experience from treatment with aluminium as the main chemical in Lærdal in 2008 the Direktoratet for naturforvaltning [*Nature conservancy body*] in its proposed treatment plan for the salmon parasite *Gyrodactylus salaris* concludes that large scale treatments with aluminium as the main chemical is not advisable until a further development of methodology has been carried out.

1.7 Therefore, consent to treat the watercourses using CFT-Legumin has been applied for. According to international standards 2 full scale treatments should carried out. These will be carried out in Autumn 2008 and Summer 2009. In addition 2 further possible treatments have been applied for if *Gyro* is recorded again after the two already planned treatments. This is in order to react quickly before a possible growth of the parasite numbers.

1.8 Objective

The objectives for treatment of the Steinkjer watercourses are:

1. To stop the further spread of *G.salaris*
2. To eradicate *G.salaris* from the infected region.

Fig. 1. Map of the Steinkjer watercourses including the rivers Steinkjerelva, Byaelva and Ogna, Figga with its barrier built in 1988 shown and Lundelva.

2. PROJECT TIMING

The treatments are planned for week 40 and 41 and treatment of the larger watercourses will take place 4th and 5th of October. Using Rotenone we are able to treat a wide range of volumes of water, but it has to be taken into consideration that weather and/or volume of water can prevent the planned treatment in some way. It is therefore important that the crew is available for a longer period of time.

3. TREATMENT AREAS

The following areas/rivers must be treated in Steinkjer and Beitstadfjorden.

1. The Steinkjer watercourse including the rivers Byaelva and Ogna
2. Figga
3. Lundselva
4. Alfarbekken
5. Lagtubekken
6. Visetbekken
7. Skjevikbekken
8. Hammerbekken
9. Sagbekken
10. Folla
11. Tunselva
12. Frøsetvågbekken
13. Kroksvågbekken
14. Skjelvågbekken

Other streams/rivers where anadromous fish can occur should be monitored. The monitoring is included in a research programme (UR-programme). This monitoring could result an expansion of the list of watercourses to be treated.

3.1 Fish barriers

Figga: The Figga fish barrier was temporarily repaired after the large floods in January 2006. The barrier has since been checked and works as planned.

Lundelva: The Lundelva fish barrier was temporarily removed by the Roads Department in 2005, but was reconstructed in the spring of 2006. Lundelva was then treated with aluminium in Autumn 2006. Lundelva was not treated above the barrier in 2007. This area must be monitored closely in 2008. The result of this monitoring will be crucial to any action taken above barriers.

Storøgla: The barrier is undamaged.

Litjøgla: The barrier was not intact up until the treatment in 2007. The area above it was therefore treated. Treatment is not necessary if the barrier is still undamaged. This will be checked prior to treatment.

Stordalsbekken: Not intact. The barrier (a culvert) was removed by the flooding in the winter of 2004/2005. The stream was treated throughout its length in 2007 and this must be repeated in 2008.

Bruemsbekken: The barrier is undamaged. It is therefore only Bruemsbekken's lower reaches that should be treated.

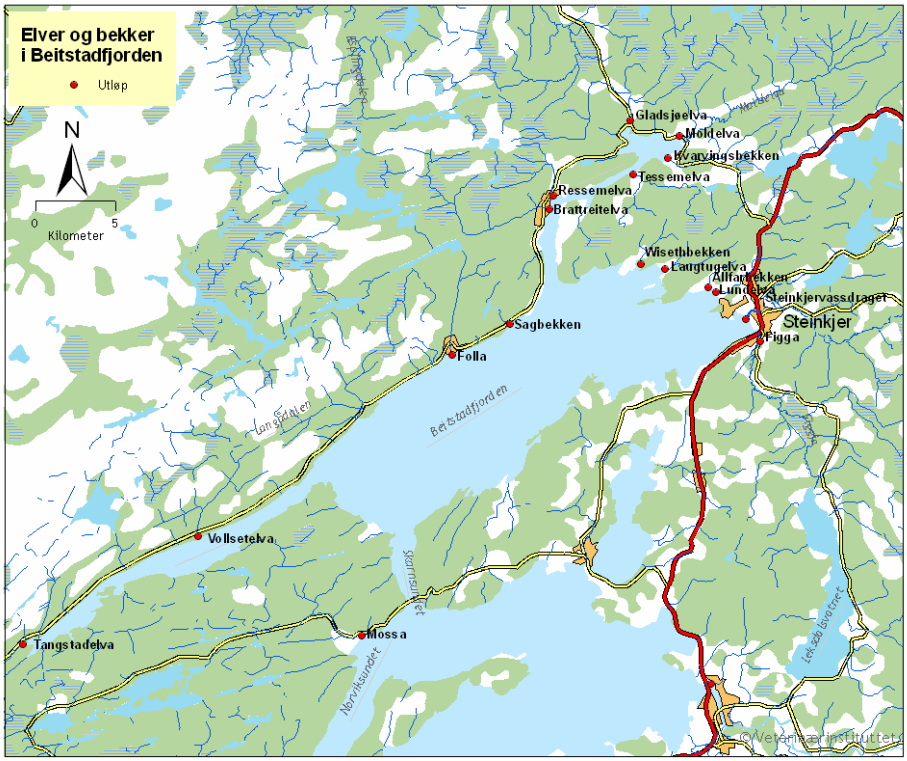


Fig. 2. Rivers and streams at Beitstadfjorden deemed to be the most obvious locations for young salmon.

4. WATER VOLUMES

4.1 Byaelva, Ogna and Figga have very different volumes of water. Table 1 shows the area precipitation and the annual average volume.

Table 1. The natural area of precipitation and annual average volumes for the rivers Steinkjerelva, Byaelva, Ogna and Figga (source: NVE)

Watercourse/river	Area of precipitation, (km^2)	Annual average volume (m^3/s)
Steinkjerelva [1]	2,125	80
Byaelva [2]	1,548	57
Ogna [3]	473	19
Figga [4]	178	6

[1] Point of measurement (limnigraph) Håkådalsbrua
[2] Estimated volume of water based on the measurement values at Håkådalsbrua, Støafoss and the water volume data for the other areas of Ogna
[3] Point of measurement Støafoss includes 82 % of the precipitation area of Ogna.
[4] Point of measurement Leksdalsvatnet includes 65 % of the precipitation area of Figga.

4.2 Byaelva/Snåsavassdraget are regulated by two hydroelectric stations downstream from Snåsavatnet (118 km^2). In addition to the lake Snåsavatnet the watercourse consist of several mid-sized lakes. The lakes and their regulation make the volume quite stable, and any sudden fluctuation is due to the hydro schemes. Table 2 shows the water levels in Byaelva (Source: the regulator, Helge-Rein-By Brug).

4.3 The hydro scheme operations are decided by economy (price of power, delivery agreements) and upon the natural conditions. In periods of plenty water and full reservoirs, the water volume cannot be controlled through adjustment. Likewise, the water volume will be lower than shown in Table 1 if there is only a little water in the reservoirs and little water movement. The minimum water volume required in Byaelva is 5 m^3/s. It is not seen as a problem to adjust the water volume through the hydro scheme to reach the required level for the Rotenone treatment for as long as this will take. This does not take into consideration periods of flooding, but it would not be possible to treat Ogna in that case anyway (see below).

Table 2. Monthly water volumes in Byaelva

Month	Volume (m^3/s)
January	45
February	40
March	35
April – approx. 15. June	50 – 250 m^3/s
June, after the 15th.	45
July	40
August - September	35
October - December	45

4.4 Ogna has few lakes in the precipitation area and the water volume is irregular. During the summer, are the spring floods, most of the daily values are between 5 and 20 m^3/s, but volumes of 30 – 40 m^3/s are not unusual. Ogna mostly has regular volumes during prolonged spells of good weather during summer and during cold period at wintertime. At those times the water volume is usually < 5 m^3/s and stable. The Rotenone treatment for Ogna can be carried out in one day. Therefore, it is only necessary to have a short period of stability in order to treat the watercourse.

4.5 The water volumes of Figga can also vary considerably in a relative short time, but Leksdalsvatnet works as a flood barrier so that the hydrological variations in Figga are not as extreme as in Ogna.

5. ORGANISATION OF THE TREATMENT PERIOD

5.1 It is planned to carry out the treatment during week 40 and 41. The main treatment of the Steinkjer watercourses has been planned for Saturday 4th and Sunday 5th October. In the week thereafter treatment of the smaller watercourses running into Beitstadfjorden

will be carried out as well as of the peripheral areas round the Steinkjer watercourses (Table 3.). The crew will be trained prior to the main treatment. It is four years since the last large Rotenone treatment as it is to be expected that we will have to use quite a number of new personnel with little or no experience of Rotenone treatments.

Table 3. Daily schedule for treatment against *Gyrodactylus salaris* in the Steinkjer region.

Date	Main activities	Comments
29/9	Relocation to Steinkjer for key personnel Preparation	
30/9	Preparation towards treatment	
1/10	Preparation towards treatment	
2/10	Preparation Construction of office, stores, workshop, dead fish reception and disinfection area. Arrival of treatment providers Info meeting	
3/10	Training for treatment providers Preparation of treatment.	
4/10	Treatment of Ogna	
5/10	Treatment of the lower parts of Ogna, Steinkjerelva, Byaelva and Figga.	
6/10	Supplementary treatment of the peripheral areas around the Steinkjer watercourses. Departure for most of the crew	
7/10	Supplementary treatment of the Steinkjer watercourse and the smaller watercourses.	
8/10	Supplementary treatment of the Steinkjer watercourse and the smaller watercourses.	
9/10	Extra day	
10/10	Extra day, clean-up and departure	

5.2 Project management
During the treatment of the Steinkjer watercourses project management will be established as during previous treatments. It will be located centrally in Steinkjer and will be in contact with all teams. The main task for the Project Management will be to oversee that the treatment of all parts of the water courses will be carried out seamlessly so that there are no gaps neither time wise nor area wise where fish can avoid the Rotenone treatment. All departures from the original treatment plan must be agreed with the project management.

5.3 Dead fish harvesters:
5.3.1 A local crew will be directed to carry out the dead fish harvesting. Local personnel will be responsible to organise the harvesting according to the plans.

5.3.2 The crew harvesting the dead fish must bring these to the indicated gathering points by the river in robust plastic bags. These bags must be marked with a zone number. The bags must not be left unattended at the side of the road. A dedicated collection crew will bring the bags to the dead fish reception area. The collection crew will carry plastic bags into which the bags left at the collection points will be inserted. This is to prevent water and blood leaking from the bags during transport and at the reception area. Upon arrival at the dead fish reception area the collection crew must place the plastic bags into closed and wheeled containers. The personnel from the dead fish reception areas will wheel the containers to be emptied and logged and then return them to the collection crew.

5.3.3 The leader of each of the fish harvesting teams is responsible for these instructions to be carried out.

- The river stretches are split into areas of responsibility/harvesting zones.
- The areas of responsibility are allocated numbers. These numbers accompany the bags of fish into the containers at the reception area. The delivery of the dead fish must be coordinated with the dead fish reception area
- All fish must be delivered to the dead fish reception area to be logged and destroyed (freezing)
- The harvesting teams are allocated their own areas of responsibility and equipment.
- The harvesting teams are organised by their own team leader.
- Individual carriers will ensure a constant delivery to the dead fish reception area.
- Lists of participants are prepared in collaboration with the appropriate groups and associations.
- A general instruction will be prepared for the fish harvester teams.

5.4 Dead fish reception area

5.4.1 The area for dead fish reception will be established in a suitable area where it will be easy to clean and disinfect.

5.4.2 At the fish reception area each individual fish will be logged. All fish will be type-determined and measured and some will also be weighed, have samples taken of scales, otolites etc. This log is important in order to document what the watercourse contained prior to a treatment. The log will help form the basis of any later restocking.

5.4.3 Plenty of space must be available for the various work teams so that good practice for differentiating between clean and unclean zones can be complied with.

5.5 Cleaning and disinfection

5.5.1 All equipment in contact with the salmon carrying water of the Steinkjer water course prior to, during and after the treatment must be treated as if it was infected with *G.salaris* including personal equipment used during the treatment. A centrally located disinfection station should be established within the area. Use 2% Virkon solution as disinfectant. All equipment should be sprayed or steeped with the Virkon solution. Laboratory tests have shown that *G.salaris* dies 10-15 seconds after having been exposed to a 1% Virkon solution. To be on the safe side, and because spraying can result in less substance effectively reaching the individual parasites, a 2% solution is used and the disinfection time is set for 15 minutes.

5.5.2 The station for disinfection of equipment will be established in the area near the workshop and equipment store. During the project the area will be split into a clean and unclean zone. All unused dispensing equipment will be stored in the clean zone. The storage and repair of used dispensing equipment will be carried out in the unclean zone. Further information will be shown in a separate plan after the locality has been decided upon.

5.5.3 As the state of infection is different in different areas of the region all equipment must be disinfected at the end of each day and in the case of major relocation (for example if relocating to another water course). Disinfection must be carried out when moving between the minor watercourses within the infected region.

5.5.4 The most probable method for spreading the infection will be via equipment and people that have been in direct contact with the infected fish. In the first instance this would be dead fish harvesters and the dead fish lab. Personnel participating in the dead fish harvesting must ensure that all equipment is disinfected each day or prior to major relocations within the watercourse and especially between watercourses as well as when relocating upwards of the watercourse. Personnel undertaking fish harvesting must ensure that all used equipment has been disinfected prior to the start of the treatment in October. All vehicles and dead fish lab personnel will throughout the period be cleaned and disinfected due to risk of infection and for reasons of cleanliness. Further information will be shown in a separate plan after the locality has been decided upon.

5.5.5 All equipment, footwear and protective clothing must be washed and disinfected after each treatment. This regulation also covers privately owned equipment. All distribution and return of equipment must be signed out and in, as this also ensures that the equipment would be disinfected.

6. IMPLEMENTATION

6.1 The following is a description of the treatment of the Steinkjer watercourses (Ogna, Byaelva, Steinkjerelva and Figga). Pre and post treatments, as well as treatment of smaller watercourses will be described in the final detailed plans. The starting time for the individual teams, the dispensing periods and Rotenone usage will be adjusted according to the water levels on the day of treatment.

6.2 Treatment of the upper levels of Ogna

The treatment will be carried out starting from above the anadromous stretch near Støa. Then similar stations will renew the dosage at Brandsegg and Bruem (Fig. 3). Depending on the water levels it can be necessary to implement a further station for renewal. The plans are based on a water volume of 5 m^3/s at Støa.

6.3 The main dispensing at Støa

Dispensing should be carried out for 8 hours starting from 7 am. In the first hour a concentration of 2 ppm CFT-Legumin should be dispensed. For the remainder of the time a concentration of 1 ppm CFT-Legumin should be used (Table 4). Hoses to dispense across the total width of the river will be used.

Table 4. The main dispensing work of Ogna at Støa. Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water Volume (m3/s)	Concentration (ppm)	Rotenone-amounts (l)
07.00-08.00	5	2	36
08.00-09.00	5	1	18
09.00-10.00	5	1	18
10.00-11.00	5	1	18
11.00-12.00	5	1	18
12.00-13.00	5	1	18
13.00-14.00	5	1	18
14.00-15.00	5	1	18
Total			**162**

6.4 Renewal at Brandsegg

Dispensing should be carried out for 8 hours starting from 8 am. The concentration for the first hour should be 2 ppm, thereafter a concentration level of 1ppm and when death caused by the dispensing at Støa has been established for caged fish, the concentration level of the dose should be 0.7 ppm CFT-Legumin (Table 5). Hoses to dispense across the total width of the river will be used.

Table 5. Renewal at Brandsegg. Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water volumes (m3/s)	Concentration (ppm)	Rotenone-amounts(l)
08.00-09.00	8	2	57.6
09.00-10.00	8	1	28.8
10.00-11.00	8	0.7	20.16
11.00-12.00	8	0.7	20.16
12.00-13.00	8	0.7	20.16
13.00-14.00	8	0.7	20.16
14.00-15.00	8	0.7	20.16
15.00-16.00	8	0.7	20.16
Total			**207.36**

6.5 Renewal at Bruem (Ogna bridge)

Dispensing should be carried out for 8 hours starting from 9 am. The concentration for the first hour should be 2 ppm, thereafter a concentration level of 1ppm and when death caused by the dispensing of the above have been established for caged fish, the concentration level of the dose should be 0.7 ppm CFT-Legumin (Table 6). Hoses should be used to ensure a good mix, including a thorough dispensing throughout the depths of Bruemshølen.

Table 6: Renewal at Bruem. Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water volumes (m3/s)	Concentration (ppm)	Rotenone-amounts(l)
09.00-10.00	8	2	57.6
10.00-11.00	8	1	28.8
11.00-12.00	8	0.7	20.16
12.00-13.00	8	0.7	20.16
13.00-14.00	8	0.7	20.16
14.00-15.00	8	0.7	20.16
15.00-16.00	8	0.7	20.16
16.00-17.00	8	0.7	20.16
Total			**207.36**

6.6 Boat teams with controllers

Boat teams are used to dispense the Rotenone solution in areas with marshland, riverbank protection schemes and gravel banks. Furthermore each team will have a controller. The controller will be responsible for the knowledge of what has been treated and will treat more peripheral spots using a watering can. A total of seven boat teams will be used each with part of the river as an area of responsibility (Table 7.)

Table 7. Overview of the treatment area for each of the individual boat teams and their start times.

Team no:	**Starting time**	**Treatment areas**
1	08.00	Støa – Brandsegg. Left bank
2	08.00	Støa – Brandsegg. Right bank
3	09.00	Brandsegg- Ogna bridge. Left bank
4	09.00	Brandsegg- Ogna bridge. Right bank
5	10.00	Ogna bridge - Fergeland. Left bank
6	10.00	Ogna bridge - Fergeland. Right bank
7	10.00	Barge with a pump in Rølla.

6.7 Drip stations

Drip stations should be used in most streams. Smaller streams and marshlands will be treated using a watering can. In larger streams a large drip should be used (200 litres) which will dispense the solution over 8 hours (Table 8). In the smaller streams smaller drips (20 litres) should be used dispensing over 4 hours. In total there will be a need for approx. 25 smaller drips. The dispensing amount will be determined in the same way as treatment upon assessment of the water volumes.

Table 8. A list of the larger tributaries with their expected water volumes, dispensing times, Rotenone-concentration and amount to dispense.

Stream	Starting	W Vol. (m3/s)	Dosage period(hrs	Conc. (ppm)	Rotenone (l)
Hyllbekken		0.02	8	1.3	0.7488
Brunbekken		0.02	8	1.3	0.7488
Langdalsbekken		0.02	8	1.3	0.7488
Litj-Øgla		0.02	8	1.3	0.7488
Stordalsbekken		0.03	8	1.3	1.1232
Rølla		0.50	8	1.3	18.72
Stor-Øgla		0.10	8	1.3	3.744
Fossembekken		0.02	8	1.3	0.7488
Myrengbekken		0.02	8	1.3	0.7488
Revsåsbekken		0.02	8	1.3	0.7488
Bruemsbekken		0.10	8	1.3	3.744
Fosslibekken		0.02	8	1.3	0.7488
Elverumsbekken		0.02	8	1.3	0.7488
Bekk ved Vivekrysset		0.02	8	1.3	0.7488
Total					**34.8192**

6.8 Treatment of the lower parts of Ogna, Steinkjerelva, Byaelva and Figga.

The treatment of Byaelva should be carried out may mainly by dispensing above the anadromous stretch at Byafossen, treatment of the lower parts of Ogna mainly at Fergeland, for Figga at its barrier and with a renewal for Steinkjerelva at Håkkådalsbrua. The water volumes in Byaelva will be adjusted according to our wishes. The calculations are based on a water volume of 5 m^3/s at Støa.

6.9 Main dispensing at Byafossen

Dispensing should be carried out for 8 hours starting from 7 am. In the first hour a concentration of 2 ppm CFT-Legumin should be dispensed. For the remainder of the time a concentration of 1 ppm CFT-Legumin should be used (Table 9). Hoses to dispense across the total width of the river will be used. It is important that the dispensing will be distributed well throughout the whole area.

Table 9. Main dispensing at Byafossen Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water volumes (m3/s)	Concentration (ppm)	Rotenone-amounts(l)
07.00-08.00	10	2	72
08.00-09.00	10	1	36
09.00-10.00	10	1	36
10.00-11.00	10	1	36
11.00-12.00	15	1	54
12.00-13.00	15	1	54
13.00-14.00	15	1	54
14.00-15.00	15	1	54
Total			**396**

6.10 Main dispensing at Fergeland

Dispensing should be carried out for 8 hours starting from 7 am. In the first hour a concentration of 2 ppm CFT-Legumin should be dispensed. For the remainder of the time a concentration of 1 ppm CFT-Legumin should be used (Table 10). Hoses to dispense across the total width of the river will be used.

Table 10. Main dispensing at Fergeland Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water volumes (m3/s)	Concentration (ppm)	Rotenone-amounts(l)
07.00-08.00	9	2	64.8
08.00-09.00	9	1	32.4
09.00-10.00	9	1	32.4
10.00-11.00	9	1	32.4
11.00-12.00	9	1	32.4
12.00-13.00	9	1	32.4
13.00-14.00	9	1	32.4
14.00-15.00	9	1	32.4
Total			**291.6**

6.11 Main dispensing in Figga

Dispensing should be carried out for 8 hours starting from 7 am. In the first hour a concentration of 2 ppm CFT-Legumin should be dispensed. For the remainder of the time a concentration of 1 ppm CFT-Legumin should be used (Table 11). Hoses to dispense across the total width of the river will be used.

Table 11. Main dispensing in Figga at its barrier. Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water volumes (m3/s)	Concentration (ppm)	Rotenone-amounts(l)
07.00-08.00	3	2	21.6
08.00-09.00	3	1	10.8
09.00-10.00	3	1	10.8
10.00-11.00	3	1	10.8
11.00-12.00	3	1	10.8
12.00-13.00	3	1	10.8
13.00-14.00	3	1	10.8
14.00-15.00	3	1	10.8
Total			**97.2**

6.12 Renewal in Steinkjerelva

Dispensing should be carried out for 8 hours starting from 8 am. The concentration for the first hour should be 2 ppm, thereafter a concentration level of 1ppm and when death caused by the dispensing of the above have been established for caged fish, the

concentration level of the dose should be 0.7 ppm CFT-Legumin. (Table 12). Hoses to dispense across the total width of the river will be used.

Table 12. Renewal in Steinkjerelva Time of dispensing, litres of CFT-Legumin to be dispensed pr. hour, expected water volume and the concentration of CFT-Legumin in the river at the point of release.

Time (am-pm)	Water volumes (m3/s)	Concentration (ppm)	Rotenone-amounts(l)
08.00-09.00	19	2	136.8
09.00-10.00	19	1	68.4
10.00-11.00	19	0.7	47.88
11.00-12.00	19	0.7	47.88
12.00-13.00	24	0.7	60.48
13.00-14.00	24	0.7	60.48
14.00-15.00	24	0.7	60.48
15.00-16.00	24	0.7	60.48
Total			**542.88**

6.13 Boat teams with controllers

Boat teams are used to dispense the Rotenone solution in areas with marshland, riverbank protection schemes and gravel banks. Furthermore each team will have a controller. The controller will be responsible for the knowledge of what has been treated and will treat more peripheral spots using a watering can. A total of seven boat teams will be used each with part of the river as an area of responsibility (Table 13.)

Table 13. Overview of the treatment area for each of the individual boat teams and their start times.

Team no:	**Starting time**	**Treatment areas**
1	08.00	Byafossen – mouth/estuary. Left bank
2	08.00	Byafossen – mouth/estuary. Right bank
3	08.00	Fergeland – river merge. Left bank
4	08.00	Fergeland – river merge. Right bank
5	09.00	Firefighting boat with pump at the estuary area.
6	08.00	Figga: Both banks

6.14 Pipe lines

Water running through pipes into the rivers will be treated with drip or watering can in the same way as other streams. Pipes not carrying water cannot be treated in this way, but due to possible pockets of stagnant water within the pipe system it is important that they are also treated. This should be done by flushing the pipe system with water containing Rotenone. Approx. 80 manholes will be opened and flushed through using a Council pump truck and IBC's// on tractor-trailers.

6.15 Drip stations

Drip stations will be used in most streams. Smaller streams and marshland will be treated using a watering can. In larger streams a large drip should be used (200 litres) which will dispense the solution over 14 hours (Table 8). In the smaller streams smaller drips (20 litres) should be used dispensing over 4 hours. In total there will be a need for approx. 15

smaller drips. The dispensed amount will be determined in the same way as treatment upon assessment of the water volumes.

Table 14. A list of the larger tributaries with their expected water volumes, dispensing times, Rotenone-concentration and amount to dispense.

Stream	Starting	W Vol. (m3/s)	Dosage period(hrs	Conc. (ppm)	Rotenone (l)
Evindeligbekken		0.02	8	1.3	0.75
Rismyrbekken		0.02	8	1.3	0.75
Lundelva		0.10	8	1.3	3.74
Total					**5.24**

7. QUALITY ASSURANCE

A successful treatment depends solely of competent personnel. All personnel taking part in the treatment will be trained in order to ensure that everyone involved will have the necessary skills.

7.1 Documentation

The first priority with regard to quality assurance is to document the effect of the dispensing before treatment has finished. Using Rotenone, this can mostly be done visually by observing the dead fish. Furthermore, water samples can be collected for Rotenone analyses. These cannot be analysed for Rotenone concentrations *in situ*, so this is a later documentation, and cannot be used to adjust the dosage. The existing methods for this are not at an acceptable level and have to be improved before it can be used satisfactorily.

7.2 Reporting

Reporting will be carried out verbally and in writing. The team leader must hand in a written report every day. The report must show what has happened for each of the items the team has been asked to undertake. The reports will be reviewed on the same day by the project management in order to find possible mistakes or oversights. Each day of treatment will end with a joint meeting where everyone involved can comment and air their views with regard to that day's treatment.

7.3 Communication

Good and open communication is important in order to find any mistakes or oversights. All crew are asked especially to communicate important events with regard to the work to other staff and management. Each team will be equipped with means of communication so that the project management at any time are in contact with the treatment providers. This is important in order for the project management to be able to manage the event and so that the crews can contact the project management in the case of queries.

8. CRITERIA AND PROCEDURES FOR STARTING /POSTPONING THE TREATMENT

8.1 The following limitations / criteria for treatment ahs been established depending on the water volumes:

- Byaelva will be controlled by the hydro scheme and will not be a problem.
- Upper levels Ogna: 25 m^3/s. It is possible to treat even if the water volumes are larger, but this is not advisable.
- Lower levels Ogna: 2 – 3 m^3/s
- The treatment will possibly be limited of the water volumes in Ogna before the water volumes in Figga will constitute a problem.

8.2 Other external factors will normally not cause a postponement, but any accidents and other events can cause unavoidable postponements. This should be evaluated on a continual basis by the project management in collaboration with the steering group.

8.3 The decision of whether a treatment should be postponed will be taken by a joint meeting of the steering group.

8.4 In case of a postponement, training of the crew will carry out regardless. The postponed treatment will be carried out in the weekend of the 11^{th} – 12^{th} of October.

ANNEX 4 DETAILED DAILY SCHEDULE FOR ROTENONE-TREATMENT OF WATER COURSES IN BEITSTADFJORDEN [FJORD OF BEITSTAD] 2008

The daily schedule starts at the first staff information meeting until the treatment has ended and the equipment returned. Fish harvesting and pre and post treatments, as well as treatment of smaller watercourses in the fjord are not included.

Day	Time	Place	Activity
Thursday 2/10	18.00	Town hall	Info meeting
Friday 3/10	08.00	KOKS	Start of training: Theory
	11.30		Lunch
	13.00	Mesta	Practical demonstration of dispensing equipment
	15.00		Distribution of equipment
	16.00		Insight into the area of treatment
	17.00	KOKS	Dinner
	18.00		Evening meeting Instructions concerning the Saturday treatment
Saturday 4/10	07.00	Støa	Dispensing begins
	08.00		The boat team for the area Støa- Brandsegg starts
		Brandsegg	Dispensing begins
		Støa	Dead fish harvesting begins
	09.00		Info to media
		Brandsegg	The boat team for the area Brandsegg-Bruem starts
			Dead fish harvesting begins
		Bruem	Dispensing begins
	10.00		The boat team for the area Bruem-Midjo starts
			Dead fish harvesting begins
	15.00	Støa	Dispensing ends
	16.00	Brandsegg	
	17.00	Bruem	
	18.00	KOKS	Dinner
	19.00		Evening meeting
Sunday 5/10	08.00	Byafossen	Dispensing begins
		Fergeland	
		Figga	
		Håkkådalsbrua	
	09.00	Byafossen	Dead fish harvesting begins
			The boat team for the area Byaelva starts
		Midjo	The boat team for the lower part of the area Ogna starts
		Figga	The boat team for the area Figga starts
			Dead fish harvesting begins
		Byafossen	Start treatment of network.
		Steinkjerelva	Dead fish harvesting begins
		Munning	Dispensing from boat begins
	16.00	Byafossen	Dispensing ends
		Fergeland	
		Figga	
		Håkkådalsbrua	
	17.00	KOKS	Dinner
	18.00		Evening meeting/close

Annex 5- Plan for disinfection and dead fish handling in connection with the Rotenone-treatment of the Steinkjer watercourses and other smaller watercourses in Beitstadfjorden, Autumn 2008

1. In general:
Precautions must be taken so that crew and all transport do not spread the disease further during the project. All equipment in contact with the salmon carrying water of the Steinkjer watercourse prior to, during and after the treatment must be treated as if it was infected with *G.salaris* including personal equipment used during the treatment. A disinfection station will be established at Mesta Guldbergaunet close to the equipment store. Personnel from the store are responsible for the continuing and constant operation of the facility and that it is staffed as per need. Use a 2% Virkon-solution as a disinfectant. After the project has finished all equipment and the relevant areas around Mesta Guldbergaunet should also be disinfected.
Participants will be informed at the information meetings. In addition, each participant will be handed a copy of the plans for disinfection and hygiene.

2. Description of organisation, cleaning and disinfection.
2.1 Procedures at the disinfection station
The station for disinfecting of equipment will be established in the area near the workshop and equipment store at Mesta Guldbergaunet. During the project the area will be split into a clean and unclean zone. All unused dispensing equipment will be stored in the clean zone. The storage and repair of used dispensing equipment will be carried out in the unclean zone. All distribution and return of equipment must be signed out and in, as this also ensures that the equipment is disinfected.

2.2 Procedures for all personnel:
- In general all equipment must be disinfected after use.
- All equipment such as waders, jackets, rakes, boats etc must be disinfected after use. Equipment only used for the dispensing of Rotenone is adequately protected due to the amount of Rotenone in the water to be used. A certain amount of activity with regard to picking and monitoring after the project can be expected – these people must go though the normal cleaning and disinfection procedure for used equipment before their work can be said to be finished.
- The crew used for fish harvesting must clean and disinfect all equipment before the Rotenone treatment of the watercourse starts.
- Crew using their own equipment that has been in contact with infected water or fish must disinfect their equipment after work.
- Dead fish harvesters must disinfect their equipment every day. Boats used for dead fish collection must be disinfected after each treatment.

2.3 Dead fish
The fish is collected into plastic bags to be transferred to either transport vessels or double bags in order to reduce mess. The plastic bags should be left at the dead fish reception area. Trailers and transport vessels should be cleaned and disinfected after the dead fish collection at the end of the project. Dead fish should be kept in a freezer van and taken to

Scanbio Bjugn after treatment. The freezer van should be cleaned and disinfected by its owner after transport.

3. PROCEDURES AT THE DEAD FISH RECEPTION AREA

3.1 Equipment at the reception area
Table and benches should be covered in plastic. Personnel should wear aprons and other cover-all clothing to be removed when leaving the room at break times etc. Clogs or other such footwear should be worn and only used in the dead fish reception area.

3.2 Procedures when receiving dead fish
A one-way system should be established when moving dead fish around the area for dead fish reception at Mesta Guldbergaunet. Move the fish to the various vessels for the zones to be dealt with by the personnel at the dead fish reception area. All personnel, trailers and equipment must be disinfected prior to leaving the unclean zone at the dead fish reception area.

3.3 Handling of dead fish at the reception area
The dead fish is received, and then the necessary registrations and testing should be carried out before the fish is collected in containers for transport to the freezer van. Any spillage during this phase should be dealt with constantly by cleaning and disinfecting.

3.4 Cleaning and disinfection of the reception
The dead fish reception areas (inside and out) should be constantly cleaned. Drains and outlets at the dead fish reception area shall as much as it is possible be safeguarded with the use of disinfectant in order to prevent further re-infection of the watercourse.

4. Treatment of other rivers and streams in Beitstadfjorden.
Every team leader must ensure that equipment and means of transport used for the treatment and the dead fish harvesting will be cleaned/disinfected both prior to and after treatment of the other watercourses. This is to prevent the infection being transferred to those watercourses not yet registered as infected.
The procedures in place for the main watercourses should also apply for these watercourses.

5. Contact persons
Disinfection plans in general: Helge Bardal 994 74 567
Practical work in relation to washing and disinfection: Egil Lund 901 30 564
Dead fish reception area: Rune Undersåker 410 05 712 (Vidar Moen 480 83 024)
Dead fish harvesters: Håvard Wist 920 56 679 (Ogna),
Asgeir Graabræk 975 46 071 (Byaelva/Steinkjerelva)
Food inspectorate: Ola Moxness 74 11 34 00/901 35 680

Annex 6 Meals and meetings

All treatment providers can have dinner at KOKS Friday, Saturday and Sunday

All treatment providers shall attend the evening meetings on the same days.

	Friday	**Saturday**	**Sunday**	**Monday**
Breakfast	07:00 09:00	06:00 08:00	06:00 08:00	07:00 09:00
Lunch	11:30 12:30	Packed lunch		
Dinner	17:00 18:00	18:00 19:00	17:00 18:00	
Meeting KOKS	08:00 11:30	19:00 20:00	18:00 19:00	
Meeting KOKS	18:00 19:00			

Annex 7- Emergency plan

In case of a serious accident

Phone: **Ambulance 113** **Fire 110** **Police 112**

State:

- **Your name**
  - Where the accident happened
  - What happened
  - Number of persons injured
  - Ask to hear what you have said
  - Do not hang up, if possible stay on the line
- **Secure the place of accident**
- **Limit the extent of the damage**
- **Use the personnel resources available**

Fire dept Steinkjer: **464 46 000 (932 48 265)**

Doctor on call Steinkjer: **74 14 10 00**

Police Steinkjer: **02800 (74 12 10 00)**

In the case of all accidents please contact project manager Asle Moen, 951 54 385

Appendix 13 Glossary

ASFB	Association of Salmon Fishery Boards
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2005
CDN	Confirmed Designation Notice issued under the Aquatic Animal Health (Scotland) Regulations 2009 when disease is confirmed
COPA	Control of Pollution Act 1974
COSLA	Convention of Scottish Local Authorities
Defra	Department for Environment, Food and Rural Affairs. Responsible for overall policy, advice to ministers and co-ordination of contingency action in England and Wales.
DI	Duty Inspector of Fish Health Inspectorate
DSFB	District Salmon Fishery Boards
DSG	Diseases Strategy Group
DWQR	Drinking Water Quality Regulator
FHI	Fish Health Inspectorate. A part of MSS responsible for enforcing fish health legislation and front line disease control measures as directed by the contingency plan.
IDN	Initial Designation Notice issued under the Aquatic Animal Health (Scotland) Regulations 2009 when disease is suspected
ISIS	Information Services and Information Systems
LDCC	Local Disease Control Centres
MSS	Marine Scotland Science
NDCC	National Disease Control Centre
NSG	National Stakeholder Group
OIE	Office Internationale des Epizooties (the World Organisation for Animal Health) responsible for the confirmation of all Notifiable diseases of animals.
SCG	Strategic Co-ordinating Group
SG	Scottish Government

SGLD	Scottish Government Legal Directorate
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SSSI	Site of Special Scientific Interest
WEWS	Water Environment and Water Services Act 2003