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*Aquaculture, Introductions and Transfers and Transgenics
Focus Area Report*

EU-UK (Scotland)

**North Atlantic Salmon
Conservation Organization**

FOCUS AREA REPORT

**AQUACULTURE, INTRODUCTIONS AND
TRANSFERS, AND TRANSGENICS**

UK (SCOTLAND)

January 2010

**Marine Scotland
The Scottish Government**

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1. Introduction

The introduction and transfers sections of this document have been developed in consultation with the Association of Salmon Fishery Boards, given the statutory licensing role of District Salmon Fishery Boards. The aquaculture sections have been provided by Marine Scotland with input from the other relevant regulators and the aquaculture industry.

This report follows the format specified by NASCO, which has at times resulted in some repetition of relevant material between sections. In addition, whilst the report is no more than a summary statement of the legal and policy framework which pervades in Scotland, it seeks to provide an appropriate level of detail and strike a balance between setting out the high level framework and sufficient detail to explain how that operates in practice.

In line with the conclusions of the NASCO-ISFA Task Force, Annexes 6 and 7 provide a summary of actions on sea lice and containment in Scotland, in tabular form, which provides a clear précis of the control arrangements in Scotland.

1.1. Activities related to aquaculture, introductions, transfers and transgenics

The Scottish Government takes a strategic approach to the aquaculture industry in Scotland within "*A Fresh Start: the renewed Strategic Framework for Scottish Aquaculture*" published in May 2009. This approach is complementary to the strategy for managing Scotland's salmon and freshwater fisheries as set out in "*A Strategic Framework for Scottish Freshwater Fisheries*" published in July 2008.

1.1.1. Aquaculture

Aquaculture makes an important contribution to the Scottish rural economy, especially in the Western and Northern Isles, where many communities are sustained by the employment provided. Scotland is the largest producer of farmed Atlantic salmon in the EU. The aquaculture industry in Scotland is estimated to have a farm gate value of £367.1 million (2008). This includes £335.7 million for farmed salmon, about £14.6 million for rainbow trout, and around £7.6 million for shellfish. Brown trout, sea trout, halibut and Arctic charr are also farmed in Scotland.

Farmed salmon in Scotland supports 1,212 direct jobs in salmon production and a significant number of jobs in salmon processing (3,733 full-time, part-time and seasonal in 2008). Production of trout and other finfish supports an additional 265 jobs with another 292 jobs in processing. Shellfish production supports 348 jobs.

Scottish production is dominated by farmed Atlantic salmon. In 2008, 36.45 million smolts were produced from 130 active freshwater sites – 17.065 million produced in freshwater cages and 19.385 million produced in tanks and raceways. 128,606 tonnes of Atlantic salmon was produced at

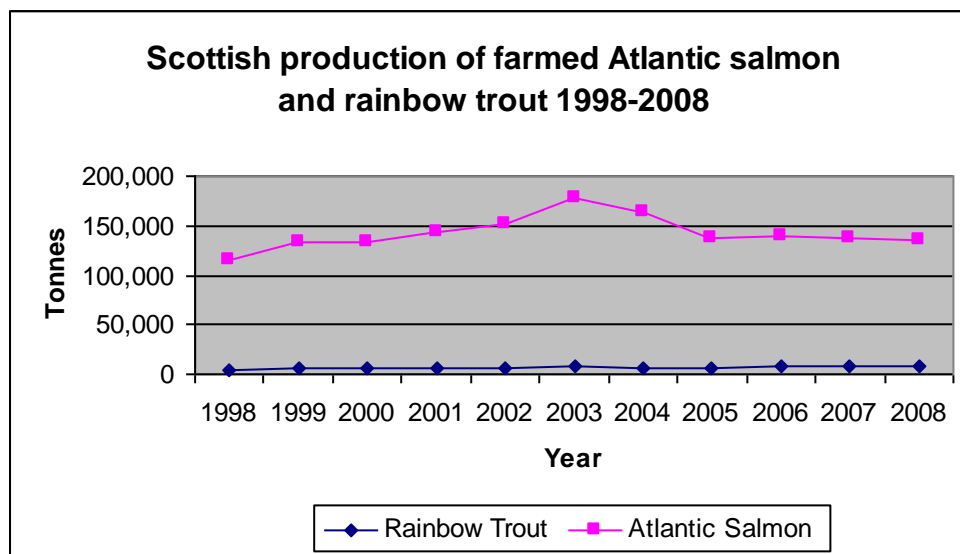
257 active marine sites – almost all produced in marine cages with 21 tonnes produced in marine tanks.

This is followed by rainbow trout. In 2008, 44 sites produced 7,670 tonnes of rainbow trout – 7 sites producing 2,562 tonnes in freshwater cages; 26 sites producing 2,463 tonnes in freshwater ponds and raceways; and 9 sites producing 2,628 tonnes from marine cages. The majority of production was for the table trade, (for human consumption), with 858 tonnes for the restocking market (fish supplied to angling waters for restocking purposes).

As noted above there is continued interest in the farming of other species. In 2008, 0.9 tonnes of Arctic charr was produced from 2 sites; 311 tonnes of brown trout/sea trout from 34 sites and 206 tonnes of halibut from 9 sites. 1,822 tonnes of cod were also produced in 2008 but production has reduced dramatically due to the liquidation of the major cod producing company¹.

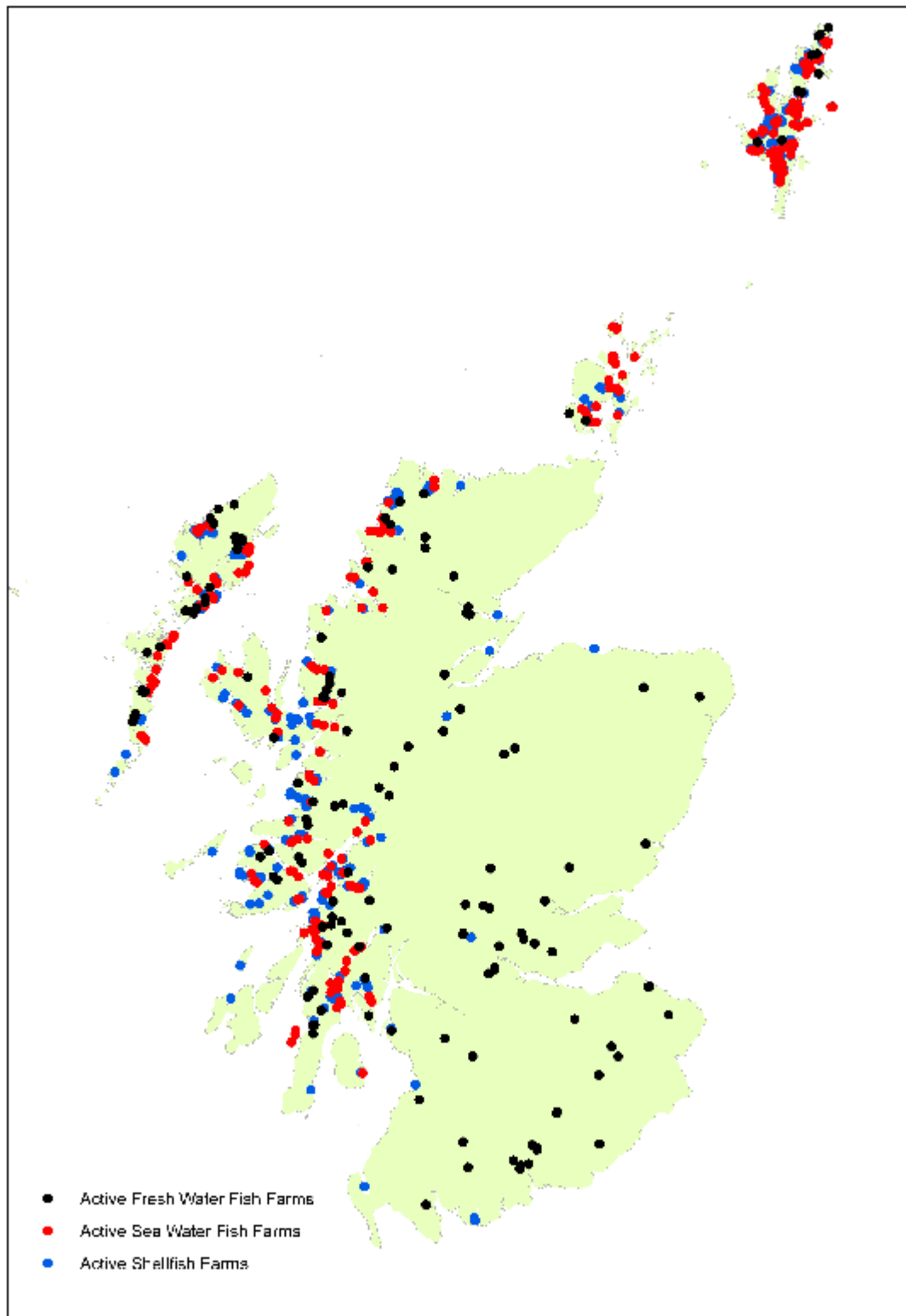
There are currently 454 active finfish sites in Scotland registered with Marine Scotland Science. Map 1 shows the distribution of sites, and Chart 1 shows production volumes since 1998.

Chart 1



¹ Scottish fish farms annual production survey 2008 (Marine Scotland Science); Scottish shellfish farm production survey 2008 (Marine Scotland Science); SeaFish Industry Authority (2008); Scottish Government Rural and Environmental Research and Analysis Directorate.

Map 1



There are 454 registered active fish farms and 329 registered active shellfish farms in Scotland (Marine Scotland Science 11 January 2010)

1.1.2 Introductions and transfers

Transfers and introductions of salmon into water bodies across Scotland for wild stock restoration or stock enhancement purposes are regulated under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003, as amended by the Aquaculture and Fisheries (Scotland) Act 2007 (2003 Act). The licensing regime for the control of introductions under Section 33A of the 2003 Act came into force on 1 August 2008.

The licensing regime applies to material at any life stage. The most commonly used life stages are eyed ova, unfed fry and fed on 0+ age group fish in their first summer or autumn although some smolts are also used. Generally, locally based hatcheries and rearing units are used. In some cases the material is raised on by commercial units prior to return to the local area for release.

Introductions of adult salmon direct to enclosed, stocked “put-and-take” fisheries from commercial fish farms to give anglers additional choice of target species, have taken place in the past, but no such operations are currently in place.

Rearing of juvenile salmon and small numbers of sea trout (*Salmo trutta*) is undertaken to supply a range of mitigation, restoration and enhancement stocking programmes; there is no stocking for ranching.

District Salmon Fishery Boards (DSFBs) are the consenting authority for the introduction of salmon and sea trout into waters within their district. Where there is no DSFB for a district and/or the introduction is of other than salmon or sea trout then Marine Scotland Science is the licensing authority under the 2003 Act. Separate but similar arrangements apply in the Tweed District for which the River Tweed Commission is the licensing authority.

Annex 1 contains further information on a survey of 25 DSFBs carried out by the Association of Salmon Fishery Boards in November-December 2009 covering 42 units; and on the number of salmon and sea trout stocked in Districts with no DSFB for the period 1 August 2008 to 31 July 2009 under licences issued by Marine Scotland Science. In addition small amounts of salmon material (total 690 unfed fry) were stocked in educational projects in Districts with no DSFB in the same period.

Brown and rainbow trout are stocked into a range of waters to support rod-and-line fisheries. Brown trout are mainly stocked into still waters with fewer released into rivers. All stocking of rainbow trout is currently into still waters such as reservoirs, lakes and small put-and-take fisheries, which are generally not accessible to salmon.

There is some small-scale rearing and stocking of non-salmonid species in Scotland. This is mainly for stocking fisheries but small numbers of certain non-indigenous species are also released for other purposes such as biomanipulation (e.g. weed control). Some stocking of non-salmonid fish is also undertaken by relocating fish between fishery sites.

1.1.3 Transgenics

In 1995 a pilot scale growth trial of transgenic salmon was conducted under licence in a secure land-based containment facility in south-west Scotland. All of the transgenic salmon were destroyed at the end of the trial. Since then, no further trials with transgenic salmon have been conducted in Scotland. The Code of Good Practice for Scottish Finfish Aquaculture (2006) states that no aquaculture company should use transgenic fish. Furthermore, the Scottish Salmon Producers' Organisation is aligned with the International Salmon Farmers' Association (ISFA) which firmly rejects transgenic salmon production.

No transgenic salmonids are reared in aquaculture facilities, or anywhere else, in Scotland at the present time.

1.2. POLICY AND MANAGEMENT STRUCTURE

Detailed planning and regulation is in place to ensure that wild and farmed salmon fisheries can operate successfully alongside one another. Regulation and policy formulated by the Scottish Government is based upon sound scientific advice formulated from research which is internationally respected, peer-reviewed and relevant to management. In relation to the complexities of many issues concerning the interaction of wild fisheries and aquaculture the Scottish Government seeks to incorporate stakeholder involvement in discussion and consultation when dealing with issues, drafting policy and introducing new legislation.

The Strategic Framework for Scottish Aquaculture sets out the environmental principles which should govern aquaculture activities:

“Farmed fish and shellfish industries should act as good neighbours by minimising risks to biodiversity and impact on the environment and other aquatic activities. Growth should be within the carrying capacity of the environment.”

The Scottish Government has endorsed the vision of the Strategic Framework for Scottish Freshwater Fisheries that:

“Scotland will have sustainably-managed freshwater fish and fisheries resources that provide significant economic and social benefits for its people.”

Within the overarching framework of international and European law, the Scottish Government has responsibility for setting the statutory and policy framework for aquaculture activities in freshwater, and in the marine waters off Scotland out to 12 nautical miles. The Scottish Government also has responsibility for the legislative and policy framework for salmon and freshwater fisheries (with separate provision under the Scotland Act 1998 for the Border Rivers, sharing a catchment area with parts of England, including the River Tweed).

Marine Scotland, a delivery-orientated Directorate of the Scottish Government, provides policy and science advice in support of those legislative and policy frameworks, along with other public agencies such as the Scottish Environment Protection Agency (SEPA) and District Salmon Fishery Boards.

Further information is available on the Scottish Government's website and the websites of the related regulatory and other authorities and representative organisations.

1.2.1. Aquaculture production businesses

The Scottish aquaculture industry's approach to containment, parasite and disease control has been evolving for a number of years, as conceptions of best practice develop. In relation to containment, parasites and disease control, this FAR seeks to describe the evolution from voluntary approaches, such as the Tripartite Working Group (TWG); to accredited schemes, such as the Code of Good Practice (CoGP); to legislation such as the *Aquaculture and Fisheries (Scotland) Act 2007*; and the current work of the Healthier Farmed Fish and Shellfish Working Group, to ensure that best practice towards disease and parasite control is adopted and applied universally throughout the Scottish industry.

In May 2009 the Scottish Government set out its vision for the aquaculture industry in Scotland in "*A Fresh Start: the renewed Strategic Framework for Scottish Aquaculture*". The framework which was developed through wide stakeholder involvement including with the wild fisheries sector, is based on six themes:

- Healthier farmed fish and shellfish (including the development of an integrated strategy to control sea lice);
- Improved systems for licensing aquaculture;
- Improved containment;
- Better marketing and improved image;
- Improved access to finance; and
- Shellfish.

A Fresh Start provides the context within which the refocused Ministerial Group on Aquaculture (MGA), chaired by the Minister for the Environment, and its 6 sub-groups operate. Membership of the MGA and the sub-groups includes representatives of the finfish and shellfish industry, wild fisheries interests, science, environmental organisations and other key aquaculture stakeholders.

Marine Scotland is responsible for the main legislative and policy frameworks applying to aquaculture. The main primary legislation is in the *Aquaculture and Fisheries (Scotland) Act 2007* (the 2007 Act). This built on earlier work including the development of an industry Code of Good Practice for Scottish Finfish Aquaculture, in operation since the beginning of 2006. As a regulatory back-stop to the Code, the 2007 Act gave Scottish Ministers new powers in relation to the measures in place for containment, the prevention of escapes of fish from fish farms and the recovery of escaped fish.

Marine Scotland's Fish Health Inspectorate, an arm of Scottish Government, along with the Scottish Environment Protection Agency (SEPA) and local planning authorities, each have roles in the regulation of the establishment, and carrying out, of aquaculture activities in freshwater and marine waters in Scotland. The main regulatory regimes cover:

- authorisation or registration with the **Fish Health Inspectorate (FHI) of Marine Scotland** under the Aquatic Animal Health (Scotland) Regulations 2009;
- Inspection and audit by **FHI** under various legislative provisions including for disease control, sea lice management and containment measures and record keeping;
- Locational controls on the establishment or significant alteration of aquaculture developments under planning powers administered by **planning authorities**; and
- Controls on discharges to the aquatic environment under the licensing regimes administered by the **Scottish Environment Protection Agency (SEPA)**.

In addition to these regulatory regimes, the accredited industry CoGP ensures the adherence of the industry to the standards set down within the code.

Scottish Salmon Producers' Organisation (SSPO): the Scottish Salmon Producers' Organisation (SSPO) is a trade body whose membership includes both freshwater and marine producers. In addition to its representational role, SSPO provides technical, scientific and communications support for its members. As a Producer Organisation, it has a number of quasi-statutory powers to facilitate the collection of production information and related statistics. The organisation is also responsible for administration of the Code of Good Practice for Scottish Finfish Aquaculture:

<http://www.scottishsalmon.co.uk/dlDocs/CoGp.pdf> .

In addition to the statutory inspections described below, all farms operated by members of the SSPO are audited against the provisions of the CoGP by the independent Inspection Service of a United Kingdom Accreditation Service (UKAS) accredited Certifying Body. The provisions of the CoGP are subject to ongoing review. Industry participants and a range of statutory and non-statutory stakeholders have already been consulted on existing provisions and publication of a revised and updated Code is expected in the course of 2010.

Marine Scotland Science (MSS) - Fish Health Inspectorate, has responsibility for registration and authorisation of all aquaculture production businesses and for carrying out statutory inspections and audits. The legislation overseen by FHI includes:

- The Aquaculture and Fisheries (Scotland) Act 2007;
- The Fish Farming Businesses (Record Keeping) (Scotland) Order 2008;
- The Aquatic Animal Health (Scotland) Regulations 2009; and

- The Animals and Animal Products (Import and Export) (Scotland) Regulations 2007 (as amended 2009).

The Aquaculture and Fisheries (Scotland) Act 2007

http://www.opsi.gov.uk/legislation/scotland/acts2007/asp_20070012_en_1

introduced provisions for the control, reduction and prevention of sea lice (*Lepeophtheirus salmonis* and *Caligus elongatus*) as well as the containment of farmed fish, the prevention of escapes and the recapture of escaped fish, and the control and eradication of *Gyrodactylus salaris*.

Record keeping requirements

Secondary legislation made under the powers in the 2007 Act included *The Fish Farming Businesses (Record Keeping) (Scotland) Order 2008 (the 2008 Order)*

<http://www.uk->

[legislation.hmso.gov.uk/legislation/scotland/ssi2008/pdf/ssi_20080326_en.pdf](http://www.uk-legislation.hmso.gov.uk/legislation/scotland/ssi2008/pdf/ssi_20080326_en.pdf).

The 2008 Order came into force on 10 November 2008 and sets out the records which must be compiled and retained by fish farming businesses for each site they farm fish, in relation to the control and treatment of sea lice and the containment of fish. The records required are listed in Schedules 1 & 2 of the 2008 Order. These records help demonstrate that farms are implementing best practice in relation to the control and treatment of parasites, including sea lice, and in relation to the containment of farmed fish and the prevention of escapes.

Fish Health Inspections and Audits

The standard against which sites are assessed under the *Aquaculture and Fisheries (Scotland) Act 2007* is based upon the provisions within the industry CoGP. Therefore, Scottish fish farm sites must meet the sea lice and containment requirements of the CoGP (where relevant) to satisfy the inspection and audit process under the 2007 Act.

All fish farm sites are inspected once per year in Scotland by the Fish Health Inspectorate (see also Section 2.10). In addition, a more detailed audit and inspection programme has been implemented by the Fish Health Inspectorate under the Act. Up to 10% of seawater fish farms are audited on an annual basis to assess the measures in place for control, reduction and prevention of sea lice (approximately 30 audits). Up to 10% of freshwater and seawater fish farms are audited annually to assess the measures in place for containment, the prevention of escapes and recovery of escaped fish (approximately 50 audits). Audits are generated through third party intelligence and a risk-based approach.

The FHI's audit and inspection powers include the power to require the production, inspection of and copying of records on the control of parasites.

Following audit or inspection, recommendations may be made to the company concerned, with implementation expected within a set time period. Follow up action by MSS may be necessary to ensure compliance. Such action may include the issuing of an enforcement notice. It is an offence if, without reasonable excuse, a person contravenes such a notice and in such

circumstances a fine of up to £2,500 may be incurred under the Criminal Procedure (Consolidation) (Scotland) Act 1995.

Marine Scotland Fish Health Inspectorate enforces the provisions within Council Directive 2006/88/EC implemented in Scotland through *The Aquatic Animal Health (Scotland) Regulations 2009*:

(http://www.opsi.gov.uk/legislation/scotland/ssi2009/ssi_20090085_en_1)

This legislation underpins a risk-based approach to aquatic animal health surveillance and introduces a system of authorisation of fish-farming businesses. Attaching conditions to those authorisations is one route through which the Scottish Government is considering introducing statutory weight to the recommendations of its Health and Containment Working Groups, as described in section 2.4.1.

The Aquatic Animal Health (Scotland) Regulations 2009 (AAHR) require the authorisation of all Aquaculture Production Businesses by the Fish Health Inspectorate (FHI). Authorisation will not be granted where there is an unacceptable risk of the spread of disease. As a last resort authorisation can be refused or withdrawn if the business represents an unacceptable risk of disease spreading.

Authorisation requires the business owner or operator to meet minimum standards for bio-security and record-keeping, with the goal of preventing the introduction, and limiting the spread, of infectious disease within the UK.

It is a condition of an authorisation that the Aquaculture Production Business must:

- a) keep a record of:
 - the movement of any aquaculture animal or any aquaculture animal product into or out of the area where the business operates;
 - the number of any aquaculture animals that have died in each epidemiological unit within the premises;
 - the results of any surveillance carried out by the business; and
 - the results of any surveillance carried out by the competent authority which have been notified to the business;
- b) comply with any surveillance requirement imposed by the competent authority;
- c) follow good biosecurity practice; and
- d) have a system in place which enables the operator to demonstrate to the competent authority (the FHI) that it is meeting the requirements of paragraphs (a) to (c).

The Regulations also provide that fisheries stocked with aquaculture animals or fish translocated from other sites for angling purposes only (e.g. put-and-take

fisheries) and other aquaculture production businesses in which aquatic animals are kept with no intention of placing them on the market (i.e. non-commercial installations) or a specialist transport business must be 'registered' with the FHI (rather than 'authorised'). Registration requires a named person - normally the owner, lease holder, operator or manager - to take responsibility for the waters. That person must report any fish mortalities and provide all reasonable help and access to the FHI in the event of a fish mortality problem.

Non-commercial installations or put-and-take fisheries may be required to be authorised if the FHI considers that this is necessary to prevent or limit the spread of disease.

Live freshwater fish or shellfish from a Third (non-EU) Country intended for farming, relaying, put-and-take fisheries or open/closed ornamental facilities, research and human consumption (or processing prior to human consumption) must be accompanied by the appropriate health certificate as outlined in Annex IV of Commission Regulation 1251/2008/EC, completed by the competent authority in the country of origin. In addition, for imports of marine fish, molluscs and crustacea for farming and relaying, research or human consumption (or processing prior to human consumption), a licence from the Marine Scotland Science Fish Health Inspectorate must be obtained in accordance with the Shellfish and Specified Fish (Third Country Imports) Order 1992 made under Section 10 of the Animal Health Act 1981.

Import consignments from third countries must be cleared at a Border Inspection Post (BIP) and must be accompanied by the appropriate original animal health certificate. One working day's notice must be given to the official veterinarian of the BIP through which the consignment is to be imported. Export consignments must be accompanied by an export health certificate. *The Animals and Animal Products (Import and Export) (Scotland) Regulations 2007* (as amended) provide for powers for veterinary inspectors to inspect import consignments and associated documentation and to issue notices requiring either the re-export of animals to source, isolation and detention or slaughter of animals, or the destruction of animal products, in specified circumstances.

Planning Authorities: Local government in Scotland plays a central role in the consenting of fish farm developments in freshwater, and in marine territorial waters out to 3 nautical miles. The local authority planning permission process covers the impacts on people or their activities and migratory and freshwater fisheries in the area. Through the current Environmental Impact Assessment (EIA) process, local authorities can and do consider navigation and the aquatic environment such as impacts on benthic fauna and flora, as guided by Scottish Natural Heritage. The main legislation is the Town and Country Planning (Scotland) Act 1997 (as amended by the Planning etc (Scotland) Act 2006).

http://www.opsi.gov.uk/acts/acts1997/ukpga_19970008_en_1

In association with related primary and secondary legislation the Town and Country Planning (Scotland) Act governs the day-to-day operation of the system. The general principle under which the planning system operates in Scotland is that decisions should be taken at the most local administrative level unless there

are strong reasons for taking decisions at a higher level. Further information on the role of local authorities and relevant legislation is provided in Annex 3. The presumption against further finfish aquaculture on the North and East coast of Scotland is enforced through the planning regime, see section 2.9.1.

Scottish Environment Protection Agency (SEPA): SEPA controls the discharge of effluent, waste and other chemicals to the water environment. The environmental effects of discharges arising from fish farms may impact at both local scale and at a wider scale as over the water body as a whole. SEPA has developed risk assessment methodologies that concentrate at the local scale, seeking to control and limit effects in the vicinity of the fish farm. Other tools have been developed to consider the water body scale effects. In addition to the controls imposed by SEPA to limit impacts at a local scale, a modelling procedure known as the “Locational Guidelines” has been developed to ensure that wider level effects are controlled and that production does not exceed the carrying capacity of the water body as a whole. SEPA will not issue authorisations for farms where the development of such a farm will lead to a breach of the locational guidelines such as the water body being classed as Category 1, as described in section 2.3.1. Discharges from fish farms are regulated by The Water Environment (Controlled Activities) (Scotland) Regulations 2005.

(<http://www.opsi.gov.uk/legislation/scotland/ssi2005/20050348.htm>).

The **Tripartite Working Group (TWG)** was formed in 1999 as a voluntary co-operative working arrangement which operates along the west and north coasts of Scotland and the Western Isles. TWG comprises members of the aquaculture industry, the wild fishery interests and Scottish Government Marine Scotland as well as a variety of regulatory bodies.

The TWG is funded by the Scottish Government. Funding has also been used to commission reports and to carry out specific projects and annual sweep-netting in the wild fisheries. Recent reports commissioned by TWG include a report on Strategic Sea Lice Control by Strathclyde University and a study by Homarus Consultants evaluating the benefits of TWG working. These and other TWG commissioned reports are available on line at:

<http://www.tripartiteworkinggroup.com>.

The TWG operates in four regions of the West and North West of Scotland. There are 4 Regional Development Officers (RDO) who are responsible to the Regional Steering Group (RSG) for carrying out the local work of TWG. Each RSG decides on the individual work programme for its area consistent with the overall aims and budget of TWG. Each RSG region contains several areas for each of which there are individual, locally-agreed Area Management Agreements (AMA), typically overseen by an Area Management Group (AMG) on which are represented wild and farmed fisheries interests. The AMGs meet regularly to support dialogue and discussion of any issues and to seek solutions that meet local needs.

Each AMA covers a specific area and includes requirements (a) for synchronous treatments and fallowing, (b) to report lice data to the group and (c) to report escapes, and for participants to help minimise any adverse effects of escapes.

RDOs provide administrative support to the RSGs and AMGs as well as writing reports on projects and on post-smolt sweep netting that they carry out. Assistance for sweep-netting is provided by Fisheries Trusts, wild fishery estates and aquaculture companies.

RDOs will generally visit farms twice a year to discuss management and local issues including sea lice control on the farm and the synchronous fallowing and treatment of sites. RDOs are also responsible for regular liaison with parties at both local and national level to ensure that the aims of the RSGs and AMGs are met.

1.2.2. Fish introductions and transfers

Under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003, as amended by the Aquaculture and Fisheries (Scotland) Act 2007 http://www.opsi.gov.uk/legislation/scotland/acts2007/pdf/asp_20070012_en.pdf all introductions and transfers of fish, including salmon, into Scottish inland waters require consent from the appropriate authority. For Districts with a statutory DSFB in place, which include most of the main Scottish salmon rivers, the DSFB is the appropriate authority for salmon (and sea trout). For other Districts and for other species in any District, Scottish Government is the appropriate authority and the licensing is carried out by Marine Scotland Science.

District Salmon Fishery Boards (DSFBs) are constituted under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003 (the 2003 Act). DSFBs are local salmon fishery bodies with statutory powers and duties to conserve and manage stocks of salmon and sea trout in districts that are defined by statute. There are currently 41 DSFBs constituted in Scotland. More specifically, under the 2003 Act as amended by the 2007 Act, it is an offence to introduce salmon or sea trout into waters within a DSFB district without the prior written consent of the relevant DSFB.

For Districts with DSFBs in place, it is often (but not always) the DSFB itself which wishes to transfer or introduce salmon. The DSFBs' representative body, the Association of Salmon Fishery Boards (ASFB), in collaboration with the Rivers and Fisheries Trusts of Scotland (RAFTS), representing the scientific fisheries trusts, launched policy guidelines for their member Boards and Trusts in August 2008. The policy guidelines promote best practice for restocking salmon and sea trout.

The ASFB/RAFTS guidelines advocate a risk-based approach to artificial stocking practice in the wild fisheries. DSFBs are advised to adopt consistent decision-making processes using the best available evidence. DSFBs are also expected to maintain accurate records of all decisions and consents issued.

ASFB/RAFTS are currently reviewing practice by DSFBs in applying the policy guidelines. A copy of the policy guidelines can be viewed at:
<http://www.asfb.org.uk/FileLibrary/Policy%20papers/ASFB%20RAFTS%20Salmon%20stocking%20policy%20paper.pdf>

Broadly comparable arrangements apply in the Tweed District:
http://www.opsi.gov.uk/si/si2006/uksi_20062913_en.pdf

Under The Scotland Act 1998 (River Tweed) Order 2006 introductions of any species of fish in the Tweed require the consent of the River Tweed Commission. Broadly speaking, the River Tweed Commission performs a similar management role to the DSFBs in Scotland, but has more extensive powers to manage not only salmon but other freshwater fish species.

The River Tweed Commission policy on stocking can be viewed at:
<http://www.rtc.org.uk/Management/Stocking/stocking.html>. The salmon to be used as broodstock in wild fisheries are often caught in the close season. This requires consent from Scottish Ministers under provisions contained within the 2003 Act which provides an additional control at the start of the production cycle. Consent will normally be issued where the proposed operation to collect broodstock does not pose a significant risk to fisheries and the wider environment. As part of the consideration of an application, regard is given to whether there may be a significant effect on a protected and/or a designated site including whether there is a need to carry out an Appropriate Assessment in accordance with the requirements of the Conservation (Natural Habitats, etc) Regulations 1994.

The Nature Conservation (Scotland) Act 2004
http://www.opsi.gov.uk/legislation/scotland/acts2004/asp_20040006_en_1 places a duty on every public body in Scotland in exercising any of its functions to further the conservation of bio-diversity so far as is consistent with the proper exercise of those functions.

1.2.3 Non-native species

The owners of still-water fisheries may wish to release a range of non-native species into their waters to support diverse and interesting fishing. The following legislative regimes regulate introductions of non-native species to help manage the potential impacts on Scotland's native fish species and their habitats:

- The Wildlife and Countryside Act 1981 which controls the release of all non-native 'species', and certain listed species that are regarded as already established, in the wild;
- The Prohibition of Keeping or Release of Live Fish (Specified Species) Order 1998 (SI 2409/1998) (as amended in 2003 by SSI 560/2003), issued under the Import of Live Fish Act 1980 (ILFA); and
- European Council Regulation 708/2007 concerning The Use of Alien and Locally Absent Species in Aquaculture.

The Wildlife and Countryside Act 1981 makes it an offence to introduce non-native species into the wild without a licence issued by Scottish Government. Orders made under the Import of Live Fish Act extend controls to the keeping as well as release of non-native fish species, thus covering aquaculture sites and the ornamental fish trade, including fish kept in aquaria and garden ponds. These provisions also require any person who releases or keeps any of the listed species to be in possession of a licence issued by the Scottish Government, although for the purposes of keeping in indoor aquaria and garden ponds a few commonly used species are covered under a general licence. The list of non-native species is kept under review and can be updated if new threats are identified.

There is a general presumption against the issue of licences for the keeping or release of the listed species.

A licence for the introduction of non-native species will not normally be issued where consent to introduce under the 2003 Act would be refused, and vice-versa. As with native species, stocking of non-natives can support the maintenance and development of fisheries for socio-economic purposes. However, to balance these needs against the risks, nearly all stocking of non-native species would normally be restricted to enclosed, artificial or highly managed fisheries, and there is a presumption against permitting any stocking that would compromise the maintenance of good ecological conditions in natural waters.

European Council Regulation 708/2007 concerning the use of alien and locally absent species in aquaculture establishes a framework governing aquaculture practices aimed at minimising the possible impact of these and any associated non-native species on native species and aquatic habitats.

In light of concerns about a potential increased trade in non-native species in the EU, a Regulation of the European Parliament and the Council amending Regulation (EC) No. 708/2007 concerning use of alien and locally absent species in aquaculture has been developed to provide better controls on the keeping and release of non-native species. Once in force the Regulation will replace the current reactive procedures, whereby risk assessments and legislative changes have to be applied retrospectively, with a more pro-active mechanism which will allow appropriate risk assessment procedures and regulations to be applied in advance of fish becoming established in trade.

1.2.4 Transgenics

Section 2.8 describes the guidelines on transgenics. Transgenic fish are not currently present within Scotland.

2. IMPLEMENTATION OF THE WILLIAMSBURG RESOLUTION

2.1. Co-operation to minimise adverse effects

2.1.1 Effective sea-lice management

A process is in place to construct a national picture of sea lice prevalence in Scotland, as described in section 2.4.4. A number of controls are already in place to ensure that effective sea-lice management is promoted, also described in section 2.4.4. and Annex 6.

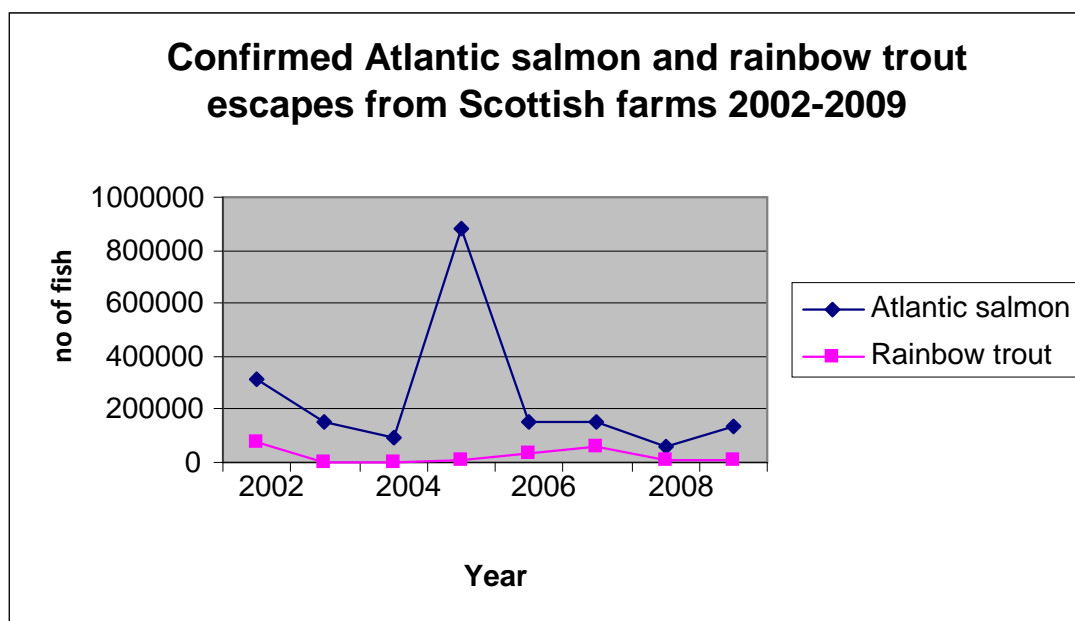
The sharing of information relating to sea lice prevalence between individual fish farming companies and wild fishery interests is governed by formal agreements signed under the auspices of the TWG. Regional Development Officers, as part of the Tripartite Working Group initiatives, receive lice data from companies on a regular basis and also visit farms to check lice data and discuss trends and synchronous treatments with local management.

The TWG also finances RDOs and Fisheries Trusts to carry out sweep netting of migratory post smolts to assess sea lice burdens. The Marine Scotland Science freshwater laboratory has recently embarked on a study to analyse the data collected to assess its usefulness. Each area produces a report on the sweep-netting results for a particular year, which also includes summaries of previous years' data and for publication when agreed by the Area Management Group on the TWG web site. See for example the report on Argyll area for 2009 on <http://www.tripartiteworkinggroup.com>.

2.1.2 Containment

Scotland retained approximately 99.8% of farmed salmon in 2008 (58,641 escaped fish from approx 30,480,000 fish in production). The trend in escapes is demonstrated in Graph 1, below. The increase in escapes in 2005 was caused by severe storms in that year.

Graph 1



The existing measures to prevent escapes of fish from aquaculture facilities, both in the CoGP and statute, are described in sections 2.4.1. It has been recognised that further progress is required, and as such further statutory controls are in development within Scotland, also described in 2.4.1 and Annex 7.

The annual Scottish Salmon and Sea Trout Catches Statistical Bulletin published by Marine Scotland since 1994 has included information by number and weight, by method and by region and district of net and rod catches of farmed salmon.

http://www.frscotland.gov.uk/Delivery/Information_resources/information_resources_view_documents.aspx?resourceId=23692&parentId=39&parentName=Surveys

2.1.3 International co-operation

The domestic work on sea lice control and containment described in sections 2.4.1 and 2.4.4 is being supported and supplemented by international co-operation on these issues. The Scottish Government has recently signed a Memorandum of Understanding (MoU) on Aquaculture Co-operation with the Norwegian Ministry of Fisheries and Coastal Affairs. The MoU includes the commitment to co-operate on:

“Environmental sustainability: environmental sustainability is an important factor in relation to future development and growth in aquaculture. Collaboration on this issue may include:

- *fish health and welfare. Important areas to consider could be husbandry, bio-security and disease prevention, risk assessments as part of business operation, spatial separation, access to veterinary medicines and understanding best use of them;*

- *technical equipment standards. Farm equipment should be fit for purpose, particularly to prevent the impacts on the environment of escaped farmed fish. Developing and sharing best practice in training for the operation of equipment. Collaboration should look at both voluntary and statutory standards.”*

Such co-operation is starting to bear fruit, with the work of the Scottish Containment Working Group and Healthier Fish and Shellfish Working Group, described later in this report, being informed by discussions between officials from both governments and working group members.

2.2. Provision of information by the proponent of an activity

A number of requirements are in place to ensure that the developers of fish farming operations provide sufficient information to meet the requirements of Article 3 of the Williamsburg Resolution. The relevant elements of the application and approval process for fish farming operations are represented in **Annex 2**. The elements are described in greater detail in the following section.

2.2.1 Aquaculture

Local government planning authorities are responsible for authorising the siting of fish farms and SEPA is responsible for issuing biomass and discharge consents. In the case of proposals for new fish farm developments or modifications to existing developments, the Scottish Government has issued a combined screening and scoping template to assess the degree of compliance with best practice. This is completed by the developer and views are sought by the Planning Authority from statutory consultees (including DSFBs, Scottish Natural Heritage and Marine Scotland Science) before an application is finalised. The applicant must submit sufficient information to allow consultees to provide a view to planning authorities on whether the proposed development is likely to have a significant effect on the environment including wild salmonids. As part of current work on the preparation of a Memorandum of Understanding between statutory consultees to the planning process, information required to be submitted by the developer is being reviewed. Following this review, clarification will be provided to planning authorities and others on the nature and level of information to be provided when submitting an application for a development proposal.

All aquaculture production businesses (inclusive of fish farms and wild fish hatcheries which move stock between water catchments) are required to be authorised in accordance with The Aquatic Animal Health (Scotland) Regulations 2009:

http://www.opsi.gov.uk/legislation/scotland/ssi2009/ssi_20090085_en_1

These regulations implement the EU Aquatic Animal Health Directive 2006/88/EC. Authorisation is granted where Marine Scotland Science (MSS), on behalf of the Scottish Ministers, are satisfied that the operation of the farm does

not pose an unacceptable risk of spreading disease to other farms or to wild fish stocks. Conditions of authorisation exist which the farm must meet in order to maintain its authorisation. These include keeping records of stock movement and mortality, participation in a risk-based surveillance scheme, the reporting of escapes or suspected escapes of farmed fish, as well as employing a farm specific Biosecurity Plan. Serious non-compliance with the conditions of authorisation could result in enforcement action including the issuing of an Enforcement Notice, prosecution and the revocation of a farm's authorisation to operate.

Section 2.4.1 describes current work to introduce statutory standards for fish farm installations for the avoidance of escapes, building on the current audit and inspection regime and CoGP standards.

2.2.2 Introductions and Transfers

In the case of proposed introductions and transfers the means for ensuring that the party wishing to transfer or introduce salmon into the water has provided all the necessary information has been described in Section 1.2.

Authorisation under The Aquatic Animal Health (Scotland) Regulations 2009 is a requirement of all fish farms and wild fish hatcheries which move stock between water catchments. As a derogation to authorisation, and due to the lower risk of disease spread, wild fish hatcheries not moving stock between water catchments will only require registration along with put and take fisheries and installations other than aquaculture production businesses where aquatic animals are kept without the intention of being placed on the market.

2.2.3 Transgenics

Section 2.8 describes the guidelines on transgenics. Transgenic fish are not present within Scotland.

2.3. Development and application of risk assessment methodologies

The Williamsburg Resolution requires Parties to develop and apply appropriate risk assessment methodologies in considering the measures to be taken in relation to aquaculture and fish movements.

2.3.1. Application of risk assessments

Planning in Scotland requires a risk assessment of factors affecting the environment and wild fisheries in addition to compliance with several general planning legislative requirements. Annex 3 sets out a list of legislation and guidance which is of relevance to planning decisions on the location of finfish farms.

Risk assessment on site selection is determined under the Environmental Impact Assessment (Scotland) Regulations 1999 (as amended). The applicant has to consider the impact that any proposed site is likely to have on the environment

through combined screening and scoping. Alternative sites should also be considered when coming to a conclusion on the most appropriate site for any new farm.

While much of the Williamsburg Resolution relates to the direct impact of aquaculture on wild salmon populations through failures of containment and disease or sea lice - the controls for which are described in Sections 2.4.1 and 2.4.4 - Annex 2, section 1.1 of the Resolution deals with the siting of fish farms in the context of potential broader environmental impacts.

In order to regulate and control the impacts of fish farms, SEPA uses a series of computer modelling packages driven by local tidal, bathymetric and meteorological data. Operators wishing to develop fish farms must apply to SEPA for an authorisation, the application being accompanied by the outputs from these models. The modelling reports describe the impacts of the fish farm and allow SEPA to place site-specific limiting conditions in authorisations to ensure that the impacts arising are within the carrying capacity of the local environment. The compliance of the farm operation with the conditions imposed is assessed through an inspection and monitoring programme.

This programme involves an assessment of the benthos and nutrient status over a water body as a whole and leads to each water body being classified as category 1, 2 or 3. Where the levels of effects is considered to pose a threat to the status of the water body and no capacity for further development exists, then the water body is classed as Category 1, where some capacity exists the water body is described as Category 2 – in such water bodies, further limited aquaculture development is permitted provided it does not lead to the water body being classified as Category 1. Category 3 waters have more scope for development.

The EU Aquatic Animal Health Directive (2006/88/EC) introduces the provision for risk-based surveillance in relation to aquatic animal health. This replaces the requirements under the previous legislation which specified active surveillance to a prescribed level. Risk-based surveillance allows the categorisation of farms as high, medium or low risk in relation to the likelihood of contracting and/or spreading aquatic animal pathogens. At present, the programme of risk-based surveillance on sites holding salmonid species is enhanced by requirements under Commission Decision 2004/453 in relation to maintaining additional guarantees for Bacterial Kidney Disease (BKD). All sites containing species susceptible to BKD are visited by MSS Fish Health Inspectorate at least on a yearly basis.

Risk assessment is considered and can be used when selecting sites for audit under the Aquaculture and Fisheries (Scotland) Act 2007 in relation to the regime concerning sea lice and containment. Consideration is given to any knowledge of historical problems in relation to escapes and lice control as well as the signage to the industry Code of Good Practice. There is scope to develop the risk-based approach further. This regime is supplemented by 'credible third party intelligence' in relation to sea lice and containment issues. Presently, all sites

which report an escape, or suspected escape of fish are audited by the Fish Health Inspectorate.

2.3.2 Introductions and Transfers

Applications to introduce or transfer salmon and sea trout are made to the Scottish Government <http://www.scotland.gov.uk/Topics/Fisheries/Salmon-Trout-Coarse/fishintros>. The applicant has to provide detailed information and a risk-assessment process is applied. This considers the source of the broodstock, numbers of ova or fish involved, the location of the receiving water and the history of transfers in the area. Additional information is taken into account, where available, for example on genetic structure of salmon populations. In the case of transfers which could affect the integrity of nature conservation sites (SSSIs/SACs) additional considerations apply and there is documentation of the background information collected, the decision making process, and the transfer or introduction (which may be either a single event, or a block of events to the one water body).

As explained in section 1.2.2, for Districts with a DSFB, it is often (but not always) the DSFB itself which wishes to move or introduce salmon. Policy guidelines promoting best practice for restocking salmon and sea trout have been developed by the DSFBs' representative body, the Association of Salmon Fishery Boards (ASFB) in collaboration with the Rivers and Fisheries Trusts of Scotland (RAFTS). The policy guidelines take a risk-based approach to artificial stocking practice using the best available advice before embarking on a programme.

2.3.3 Transgenics

Section 2.8 discusses the arrangements in Scotland governing the proposed use and release of genetically modified organisms. There is currently no rearing of transgenic salmonids in aquaculture facilities in Scotland.

2.4. Measures taken to:

2.4.1. Minimise escapes of farmed salmon

The role of the SSPO and its accredited Code of Good Practice (CoGP) was described in section 1.2. In relation to minimising escapes of farmed salmon, the **CoGP** includes:

- a. Provisions regarding pens, net and mooring systems including design, installation and inspection,
- b. Requirements for tank and pond systems,
- c. Detail regarding boat operations,
- d. Detail regarding fish transfer and handling,
- e. The procedures for dealing with escapes of farmed fish including a requirement to have contingency plans in place, and
- f. The technical standard of equipment which is based upon attestation from the manufacturer or other suitably qualified person.

The existing provisions of the CoGP relating to containment are now somewhat outdated, and the great majority of farms currently deploy equipment and follow practices which significantly exceed the current requirements of the Code. The Code is being reviewed.

Verifying compliance with the Code of Good Practice/audit and inspection

The independent (*non-statutory*) audits of farms carried out to ensure compliance with the CoGP will often identify deficiencies in equipment, Standard Operating Procedures (SOPs) for the inspection of equipment, and SOPs covering activities likely to increase the risk of escapes (e.g. boat handling around pens, grading and net changing). Where such deficiencies are identified, the farmer is required to take remedial action to deal with the problem within a specified period of time. In the event of significant deficiencies being identified, a follow-up audit may be carried out to demonstrate compliance.

The current *statutory* requirements relating to the audit and inspection of fish farms for the purposes of the avoidance of escapes are set out at Section 1.2 and Annex 3.

Procedures for reporting losses

In 2002 the Scottish Executive (now Scottish Government) introduced legislation that made notification of finfish farm escapes a statutory requirement and applied to all finfish farmers operating in Scotland (*The Registration of Fish Farming and Shellfish Businesses Amendment Order 2002*). This meant that fish farmers must notify Scottish Ministers, in writing, of escapes, or when there is cause to suspect that there is a significant risk that an escape may have occurred. 'Significant risk' is not defined in the Order but examples may include: a tear in the net and/or the presence of fish in the immediate vicinity of the farm site which may be farmed fish. *The Aquaculture and Fisheries (Scotland) Act 2007* requires all fish farmers to comply with the standards in the CoGP (regardless of whether that company is signed up to the CoGP on a voluntary basis) that relates to containment and escapes. Failure to comply could lead to revocation of the farm's authorisation to farm.

In the event of a suspected escape, the farm operator checks site integrity and/or undertakes counts, depending on the circumstances, and subsequently notifies the Scottish Government if they believe an escape has occurred. Operators are also encouraged to alert local wild fish interests to possible escapes, although this is not a statutory obligation. Every suspected escape is investigated by the Scottish Government. This initially involves contact with all the farms in the locality and, if deemed necessary, follow-up site inspections by the Fish Health Inspectorate. Non-reporting of an escape is an offence attracting a fine at level 4 on the standard scale, which currently stands at £2,500. An operator is obliged to notify Scottish Ministers if they believe an escape has occurred from their site or there is a significant risk that an escape has occurred.

Containment Working Group including technical standards for fish farms

The Containment Working Group, established by the Ministerial Group on Aquaculture to strengthen Scotland's approach to escape avoidance has identified a number of steps to bolster the current control regime as it relates to escapes.

The containment working group intends to strengthen that regime by:

- Developing a technical standard for fish farms covering production in the marine and freshwater environments, including smolt production. This standard will be supported by regulation and so be obligatory. This takes forward the current CoGP requirement for attestation of equipment suitability from a qualified individual.
- Introducing accredited training for fish farm workers to mitigate against the risk of escapes, for example on net handling and repair.
- Commissioning research and development work to provide technical solutions which allow for the early identification and repair of holes in nets; and into trialling of better net materials.
- Reviewing how the causes of escapes are reported to maximise the learning which can be gained from each such events and further mitigation measures to be put in place; and to allow for maximum international comparability.
- Best practice workshops for the Scottish salmon and trout industry informed by MSS FHI audit recommendations.
- Workshops on the correct use of Acoustic Deterrent devices for predators for industry and regulators.
- Review of current fresh water containment standards.

The Scottish Government views this work as a significant step forward, as the Scottish aquaculture industry moves from voluntary to statutory adherence to the highest containment standards; with associated accredited training. The precise nature of the legislative framework that will govern containment standards is being developed through partnership work including with representatives of the wild fisheries interests and informed by MSS advice and research. See also Annex 7.

2.4.2. Minimise impacts of ranched salmon

Salmon ranching as defined in Annex 1 of the Williamsburg Resolution is not presently carried out in Scotland.

Ranching circumvents restrictions on the natural productive capacity of rivers (Webb, Youngson and Verspoor, 2009) and involves rearing salmon under hatchery conditions and liberating them, typically at the smolt stage, with the

intention of cropping the adult fish on their return from the sea. The risks and potential impacts associated with ranching are highlighted in published guidance on stocking (Youngson, 2003):

<http://www.frs-scotland.gov.uk/Uploads/Documents/Stocking.pdf>.

2.4.3. Minimise adverse interactions from enhancement activities

A range of measures are used to minimise adverse impacts from salmon enhancement activities and these are summarised in section 1.2. These measures are consistent with Annex 4 of the Williamsburg Resolution and are underpinned by NASCO's Guidelines on the Use of Stock Rebuilding Programmes (CNL(04)55), the Decision Structure for Management of North Atlantic Salmon Fisheries (CNL31.332), and the Plan of Action for the Protection and Restoration of Atlantic Salmon Habitat (CNL(01)51). The measures provide a basis for determining if stocking is appropriate for the circumstances. In accordance with the Precautionary Approach a risk assessment approach is used to evaluate proposals for stocking and proponents must provide all information necessary to demonstrate that stocking will not have a significant adverse impact on wild salmon populations or have an unacceptable impact on the ecosystem. In addition, good practice is promoted through the following additional measures and guidance documents, all of which are considered to be compliant, or to promote approaches compliant, with Annex 4 of the Williamsburg Resolution:

- Development of a Code of Good Practice on stocking under the Strategic Framework for Freshwater Fisheries

<http://www.scotland.gov.uk/Resource/Doc/229830/0062252.pdf>

- Guidance issued in 2007 by Fisheries Research Services (now Marine Scotland) on hatchery work in support of salmon fisheries

http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/SFRR_65.pdf.

- Earlier guidance issued by Fisheries Research Services in 2003 on whether or not to stock with salmon or sea trout:

<http://www.frs-scotland.gov.uk/Uploads/Documents/Stocking.pdf>

- Restoration guidance issued by the Tripartite Working Group in June 2009 for Scottish west coast salmon and sea trout fisheries:

<http://www.tripartiteworkinggroup.com/article/uploaded/TWGRESTORATIONGUIDANCEJune2009.pdf>.

This report aims (1) to make the scientific background accessible to those with an interest in the management of salmonids in order to support evidence-based policy-making and fishery management, and (2) to home-in on the fisheries of the western Scottish rivers in order to identify an approach to restoration justified by the scientific evidence. This should aid decision-making in the more general context of what is possible, what might

be achieved, how long it would take and how risky it might be. This report therefore seeks to offer guidance on restoration activity in the freshwater environment and support for river management planning by local fisheries managers and other interested parties.

A collaborative project (Focusing Atlantic Salmon Management on Populations – FASMOP) is underway to provide a genetic basis for management of salmon populations in Scotland and this information will be used to minimise further the potential for adverse genetic interactions from activities such as introductions and transfers. Further information on the FASMOP project and related work under SALSEA MERGE and the MSS research programme is contained in Annex 5.

Some of the issues involved in the restoration of salmon fisheries cross-over with related fishery and environmental initiatives that have been raised previously. Thus, for example, NASCO has prepared guidelines on salmon stock rebuilding² and habitat protection³ and the Scottish Environment Protection Agency (SEPA) promotes freshwater environmental restoration⁴ in the context of the EU Water Framework Directive. Scottish Natural Heritage (SNH) has designated 17 salmon rivers as Special Areas of Conservation (SACs)⁵ under the EU Natura 2000 system (Habitats Directive)⁶ and co-ordinated efforts to enhance the conservation of salmon via the Salmon LIFE project.⁷ The TWG Restoration Report is complementary to previous and ongoing initiatives of this type; and deals more specifically with fishery restoration in the context of the practical management of salmon and/or sea trout fisheries in rivers that are impacted by long-term declines.

2.4.4. Minimise risks of disease and parasite transmission

Scotland has a wide-ranging surveillance programme to guard against the possibility that diseases that could have a long-term deleterious effect on Atlantic salmon are identified at an early stage.

Comprehensive fish health programme

Marine Scotland's Fish Health Inspectorate enforces the provisions within Council Directive 2006/88/EC implemented in Scotland through The Aquatic Animal Health (Scotland) Regulations 2009.

² http://www.nasco.int/pdf/nasco_cnl_04_55.pdf

³ http://www.nasco.int/pdf/nasco_res_habitatpoa.pdf

⁴ http://www.sepa.org.uk/water/river_basin_planning/restoration_fund.aspx

⁵ http://www.jncc.gov.uk/ProtectedSites/SACselection/SAC_list.asp?Country=S

⁶ http://www.sepa.org.uk/air/process_industry_regulation/habitats/habitats_directive.aspx

⁷ <http://www.snh.org.uk/salmonlifeproject/pdf/LIFE%20Project%20Newsletter%201.pdf>

(http://www.opsi.gov.uk/legislation/scotland/ssi2009/ssi_20090085_en_1). This legislation permits a risk-based approach to aquatic animal health surveillance. However, at present, the surveillance programme operated within Scotland, in relation to farmed salmonids, is dictated by Commission Decision 2004/453/EC requiring annual inspection and sampling every second year to screen for the presence of *Renibacterium salmoninarum* the causative agent of BKD.

The wild fish surveillance programme involves sampling wild salmonids from various river catchments. Scotland's freshwater environment has been divided into 55 areas comprising of either a single District Salmon Fishery Board (DSFB) area or an amalgamation of two or more of the smaller DSFB's. By sampling 11 sites per year the programme aims to collect samples from all 55 areas over a 5 year period. Fish are screened for the relevant listed diseases. In addition, a general bacteriology screen is conducted. Histopathology samples are collected from fish exhibiting clinical or post-mortem signs of disease.

Where the presence of a listed disease is detected then control and eradication measures (where necessary) are placed upon the fish or shellfish farm site and surrounding area as dictated by current policy and in accordance with both relevant domestic and European legislation.

Within Scotland, the current policy is to contain and eradicate the exotic fish diseases, Epizootic Haematopoietic Necrosis (EHN) and Epizootic Ulcerative Syndrome (EUS), and the non-exotic fish diseases Viral Haemorrhagic Septicaemia (VHS), Infectious Haematopoietic Necrosis (IHN) and Infectious Salmon Anaemia (ISA).

In accordance with Commission Decision 2004/453 Scotland has Additional Guarantees for both *Gyrodactylus salaris* (Gs) and Bacterial Kidney Disease (BKD). Additional Guarantees afford extra protection in relation to the potential introduction of Gs and BKD through the trade in aquatic animals. The European Commission has approved Scotland's control and eradication programme in relation to BKD. Where this pathogen is detected control measures are put in place to limit the risk of pathogen spread. Farms may be permitted to on-grow fish before fallowing, or move fish to areas of equal disease status where this facilitates clearance. Progressive fallowing on site may be an option where strict biosecurity measures between stocks are implemented and adhered to.

Scotland is classified as free from Gs and our policy is to apply preventative measures. If the parasite was introduced to Scottish waters the policy would be to contain and eradicate, where possible, based on assessments contained in the current Contingency Plan for Scotland and using powers similar to those described for exotic and non-exotic diseases. Statutory powers exist to carry out activities to eradicate Gs and include powers to clear fish farms, create barriers and administer treatments.

Pest management – including area management approaches, single-year class stocking, and treatment strategies

Sea Lice

The Healthier Fish and Shellfish Working Group established by the Ministerial Group on Aquaculture is working to update the current measures for the control of sea lice and disease and will make its recommendations to the Minister for Environment in 2010.

The Healthier Fish and Shellfish Working Group intends to update the current regime by:

- Introducing a national system for the publication of sea lice data across appropriate scale management areas.
- Introducing threshold levels which would be used to notify Marine Scotland of concerns regarding sea lice levels and mortality levels.
- Ensuring single-year class stocking, fallowing and synchronous lice treatments, within appropriate scale (from a disease and parasite control perspective) management areas, underpinned by statutory Area Management Agreements.
- Introducing statutory reporting requirements for the suspicion of sea lice resistance to therapeutants.
- Ensuring appropriate sampling and treatment strategies to maximise the effectiveness of sea-lice medicines.
- Introducing controls on the movement of live fish from one management area to another.

The Scottish Government believes that the cumulative impact of these changes will be to ensure that the Scottish Aquaculture industry has the highest possible biosecurity and fish health and welfare standards, with a regulatory approach to ensuring that the best practices are applied for the control of sea lice and disease on an integrated appropriate area-wide basis.

The Scottish aquaculture industry is also working closely with various academic institutions to develop the use of wrasse as a cleaner fish in Scotland. That work has been reinvigorated in 2009, with a project considering commercial viability underway at the beginning of 2010.

Area Management Agreements are the cornerstone of formal agreements within the **Tripartite Working Group**, which operates currently. The associated Area Management Groups consist of representatives of the aquaculture industry and wild fisheries interests, supported by the TWG Regional Development Officer, local Fisheries Trusts, ASFB, RAFTS and the Scottish Government. It is for the signatories of each agreement to agree the precise details but each agreement

will contain a requirement for synchronous following and treatment. In small areas this will usually encompass the whole area but in larger areas there may be sub-divisions into smaller management areas within which synchronous following and treatment should be achieved. This voluntary approach will be replaced by a stronger, statutory, approach to Area Management Agreements, described in outline below. See also Annex 6.

2.5 Movements into a Commission area of reproductively viable Atlantic salmon or their gametes that have originated from outside that Commission area should not be permitted; unless they have adequate health certification under EC Directive 2006/88/EC, as regulated by the Aquatic Animal Health (Scotland) Regulations 2009 and the Animals and Animals Products (Imports and Export) (Scotland) Regulations, 2007, as amended 2009.

There have been no movements of aquaculture animals into the Commission area since 2003, except from Australia (Tasmania) and USA. Salmon ova were imported from Tasmania in 2003, 2004 & 2006 and from USA in 2003, 2004 & 2005 (see Annex 4).

Salmon ova has also been permitted, under certification from The European Free Trade Association (EFTA) member countries; an intergovernmental organisation set up for the promotion of free trade and economic integration to the benefit of its four member States: Iceland, Liechtenstein, Norway and Switzerland. The Animals and Animal Products (Import and Export) (Scotland) Regulations 2007, as amended in 2009 lay out guidelines for imports/exports of animal products into Scottish waters. In recent years this has resulted in the importation of ova from Norway and Iceland within the NASCO NEAC area.

2.6 Introductions of viable non-indigenous anadromous salmonids

The Williamsburg Resolution states that the introduction into any Commission area of reproductively viable non-indigenous anadromous salmonids or their gametes should not be permitted.

The Williamsburg Resolution advises that no non-indigenous fish should be introduced into a river containing Atlantic salmon without a thorough evaluation of the potential adverse impacts on the Atlantic salmon population(s) which indicates that there is no unacceptable risk of adverse ecological interactions. The regulations pertaining to the release of non-native fish species in Scotland are described in Section 1.2.2. There is a strong presumption against releasing any non-native fish into rivers containing salmon.

2.7 No non-indigenous fish should be introduced into a river containing Atlantic salmon without a thorough evaluation of the potential adverse impacts on the Atlantic salmon population(s) which indicates that there is no unacceptable risk of adverse ecological interactions.

Any proposals for the introduction of non-indigenous fish into a river containing Atlantic salmon would be dealt with by the processes for the licensing of

proposed introductions of fish into freshwater already described in 1.2.2. In addition, an applicant would have to have permission to keep or release various specified species of fish which are non-native to Scotland (but not rainbow trout) under the Prohibition of Keeping or Release of Live Fish (Specified Species) (Scotland) Order 2003 and/or under the Wildlife and Countryside Act 1981 as described in section 1.2.2.

These measures are effective in preventing the introduction of non-indigenous fish where there could be an unacceptable risk to salmon populations or of adverse ecological interactions.

2.8 The Parties should apply the Guidelines for Action on Transgenic Salmon (Annex 5 of the Williamsburg Resolution – CNL(04)41), to protect against potential impacts from transgenic salmon on wild stocks

The use and release of genetically modified organisms (GMOs) is tightly regulated in Scotland. The contained use of GMOs is regulated by the Health and Safety Executive under Directive 98/81/EC and implemented through the Genetically Modified Organisms (Contained Use) Regulations 2000, the Genetically Modified Organisms (Contained Use) (Amendment) Regulations 2002 and the Genetically Modified Organisms (Contained Use) (Amendment) Regulations 2005.

The release of GMOs is regulated by the Scottish Government under Council Directive 2001/18/EC and implemented through the Genetically Modified Organisms (Deliberate Release) (Scotland) Regulations 2002, and the Genetically Modified Organisms (Deliberate Release) (Scotland) Amendment Regulations 2004.

In 1995 a pilot scale growth trial of transgenic salmon was conducted under licence in a secure land-based containment facility in south-west Scotland (http://www.nasco.int/pdf/reports_activities/nasco_report19951997.pdf). All of the transgenic salmon were destroyed at the end of the trial. Since then, no further trials with transgenic salmon have been conducted in Scotland.

The Scottish Government has a policy position against the cultivation of genetically modified crops, and would apply such caution when considering any applications for the use of GMOs in aquaculture on a case-by-case basis, should they arise.

The Code of Good Practice for Scottish Finfish Aquaculture (2006) states that no aquaculture company should use transgenic fish. Furthermore, the Scottish Salmon Producers' Organisation is aligned with the International Salmon Farmers' Association (ISFA) which firmly rejects transgenic salmon production.

2.9 Parties should, as appropriate, develop and apply river classification and zoning systems in accordance with Annex 6 of the Williamsburg Resolution for the purposes of developing management measures concerning aquaculture, and introductions and transfers

2.9.1 Aquaculture

Scotland has implemented a presumption against further finfish aquaculture development covering the North and East coasts of the country. This extensive zone covers a large proportion of the coastline of Scotland and its most highly productive salmon river catchments. The presumption restricts the activities of aquaculture companies in this zone.

Proposals for aquaculture developments anywhere in Scotland require the consent of Local Authorities under planning legislation. They are obliged to take into account potential impacts on salmon rivers. Statutory consultees include SNH, SEPA, MSS and the relevant DSFB. Under the 1992 EC Habitats Directive, 17 rivers in Scotland have been classified as Special Areas of Conservation (SAC) where the Atlantic salmon is either a primary reason or qualifying feature. These rivers are strictly protected from adverse anthropogenic interference.

These already extensive protections may be enhanced further with the introduction of Marine Spatial Planning in Scotland. The current Marine (Scotland) Bill proposes to introduce such a system to ensure better stewardship of the seas by balancing competing claims for their use. This will build on existing work by local authorities such as Highland Council, which has introduced Aquaculture Framework Plans which suggest areas in which aquaculture development should - and should not - take place.

Rivers in Scotland are classified under the Water Framework Directive according to ecological quality elements. Around 37% of the total area of current running water salmon habitat is at high or good status (little or no change in relevant biological quality elements as a result of human activities), while around 48% of current still water salmon habitat is at high or good status (UK Scotland FAR Report on Protection, Restoration and Enhancement of Habitat, 2008).

2.9.2 Introductions and transfers

DSFBs are responsible for regulating introductions and transfers of salmon and sea trout in rivers in their District. Marine Scotland covers those Districts where there is no DSFB and species other than salmon and sea trout. Section 1.1.2 contains further information.

2.10 The Parties should initiate corrective measures without delay where significant adverse impacts on wild salmon stocks are identified

There is a legal requirement for fish farmers to report escapes or suspect escapes under the Aquaculture and Fisheries (Scotland) Act 2007, to Scottish Government within 24 hours of the event being discovered. The CoGP also requires that the local DSFB and the local Fisheries Trust are notified within 24 hours so that any potential damage is minimised. The CoGP also requires farmers to have site-specific contingency plans that describe the actions to be taken in the event of an escape occurring.

Escapes will be investigated by Fish Health Inspectors who will ascertain what action has been taken to prevent and minimise the risk of further escapes. Failure to take action could be considered as a contravention of the Act and the requirement to take satisfactory measures, depending on the circumstances surrounding the escape, could result in a review or amendment to the procedures.

The CoGP contains A National Strategy for the Control of Sea Lice on Scottish Salmon Farms. The Strategy covers written undertakings to observe the provisions of the strategy, agreements on monitoring protocols, frequency of monitoring and agreements on the timing and criteria for treatments.

The Aquaculture and Fisheries (Scotland) Act 2007 introduced provisions regarding fish and shellfish farms, *Gyrodactylus salaris*, salmon and freshwater fisheries, and sea fisheries. Relevant to aquaculture, it allows inspection of finfish farms to assess whether satisfactory measures are in place for controlling parasites (sea lice) and for containing farmed fish and preventing escapes. The legislation was introduced as a backstop to the measures in the voluntary *Code of Good Practice for Scottish Finfish Aquaculture* to ensure that all fish farms adhere to certain minimum standards. Scottish Ministers have discretion to serve enforcement notices where the measures are found to be insufficient or there are problems which need to be rectified.

Secondary legislation was required to implement the Act. *The Fish Farming Businesses (Record Keeping) (Scotland) Order 2008* sets out the records which must be compiled and retained by fish farming businesses for each site where they farm fish, in relation to the control and treatment of sea lice and the containment of fish. The Order came into force on 10 November 2008.

[http://www.statutelaw.gov.uk/content.aspx?LegType=S.S.I.+\(All+Scottish\)&searchEnacted=0&extentMatchOnly=0&confersPower=0&blanketAmendment=0&sortAlpha=0&PageNumber=10&NavFrom=0&parentActiveTextDocId=3522863&ActiveTextDocId=3522867&filesize=2101](http://www.statutelaw.gov.uk/content.aspx?LegType=S.S.I.+(All+Scottish)&searchEnacted=0&extentMatchOnly=0&confersPower=0&blanketAmendment=0&sortAlpha=0&PageNumber=10&NavFrom=0&parentActiveTextDocId=3522863&ActiveTextDocId=3522867&filesize=2101)

Marine Science Scotland has developed an inspection regime and associated inspector's guidance including investigation and audit report checklists, in parallel with the development of the Record Keeping Order. The inspection regime takes a risk-based and intelligence-based approach involving both inspections and audits. This includes analysis of sea lice records and inspection of stock for sea lice; a visual assessment of the site to look for any containment issues and enquiry into the causes of previous escapes. Containment audits involve analysis of record keeping, site integrity and operational practices in relation to the risk of an escape of fish. An inspection may recommend a site for more detailed investigation through an audit. Up to 10% of sites will be audited annually, this equates to about 30 seawater sites for sea lice and about 50 sites (freshwater and seawater) for containment.

The Act allows for the issuing of enforcement notices under Section 6. Whilst taking cases with the aim of prosecution is an option under this legislation, the initial focus will be on working with the industry to improve conditions on sites for its own benefit and the benefit of the wider environment. In accordance with

good practice MSS' enforcement procedure involves issuing advice verbally and formally in writing with follow-up inspection as and when necessary, prior to taking action through the issuing of any Enforcement Notices. A programme of inspections and audits commenced November 2008.

A number of corrective measures are described elsewhere in this document:

- Statutory requirement to report escapes – see section 2.4.1
- Regulatory powers regarding containment and lice control – see sections 2.4.1 and 2.4.4
- Farms have contingency plans for escapes – this is a legal requirement, as per the Record Keeping Order.
- As an example of a voluntary mitigation measure Loch Fyne, on the west coast of Scotland, has been the focus of relocation of 3 fish farms in the management of one company which is a member of the local TWG Area Management Group. The company undertook the relocation exercise in consultation with local wild fishery interests.

The Scottish Government remains open to supporting proposals for fish farm relocations on occasions when such relocations are acceptable to both the wild fish and aquaculture interests, for mutual benefit.

As described in Section 2.4.4 contingency plans have been developed for major threats such as the possible introduction of *Gyrodactylus salaris*.

2.11 Each Party should encourage research and data collection (as detailed in Annex 7 of the Williamsburg Resolution) in support of the Williamsburg Resolution and should take steps to improve the effectiveness of the Williamsburg Resolution

The salmon farming industry, through SSPO, supports work, including research and development projects, on various aspects of sea lice control and improved containment. Current action on sea lice control includes the identification, development and licensing of new treatments, measures to optimise the use of existing and new treatments to preserve efficacy, the use of biological controls (i.e. wrasse as cleaner fish), and modelling, data gathering and analysis to underpin the development of Area Management Agreements (including synchrony in production and treatment). Work on improved containment includes the assessment of new net technology and seminars and workshops designed to facilitate the exchange of information on equipment and its use in fish handling techniques and procedures.

The SSPO is also currently engaged in the establishment of a system for sea lice data collection, handling and analysis. The primary purpose of this system is to provide information to companies involved in the development and implementation of Area Management Agreements to improve the flow of information and improve the effectiveness of joint arrangements for sea lice

management and control. The system will also allow the public disclosure of certain information on sea lice control via the SSPO website. In due course, it is proposed that the system will be expanded to include the collection of other salmon farming data.

Additional scientific research carried out in Scotland is co-ordinated through the Scottish Aquaculture Research Forum (SARF). Information on SARF-sponsored projects is available on <http://www.sarf.org.uk/research.html>. SARF was formed in 2004 as part of the original Strategic Framework for Scottish Aquaculture. The Board consists of Directors derived from the member organisations including representatives from the aquaculture industry, government organisations, wild fish groups and environmental NGOs. Its aim is, through support of research, and dissemination and publication thereof, to promote and encourage a sustainable, diverse and economically viable aquaculture, based on the principles of stewardship, social responsibility and working within the carrying capacity of the environment, both locally and nationally and throughout its supply chain.

Marine Scotland Science has developed a bio-physical model of planktonic sea louse dispersal for the Loch Torridon area. The model can predict the transport of sea lice larvae and produce maps of infectivity under different environmental conditions. The results from the model are being validated using larval counts from coastal and offshore sample stations and by the use of sentinel cages to measure the infection pressure on salmonids. Work is also underway to test this model in other locations.

Geographical variations in lice burdens of wild sea trout, and the link to production on local farms, are being investigated on the West Coast of Scotland. In addition, an investigation into the return rates of sea trout from the River Shieldaig, and the links with fish farming, are ongoing.

Scotland is also engaged in a range of other research underpinning Atlantic salmon conservation. Studies are underway to delineate intraspecific biodiversity in relation to the division of the species into sub-specific taxa, functionally and evolutionarily distinct regional stock groups, metapopulations and distinct breeding populations with and among rivers; this work is carried out variously and collectively under Marine Scotland Science Research Projects ROAMEs SF0271 and SF0279, the RAFTS-Marine Scotland FASMOP collaboration, and the international public-private partnership SALSEA-MERGE project funded by the European Union, NASCO's International Atlantic Salmon Research Board, the Atlantic Salmon Trust and the TOTAL Foundation.

This work is providing background information useful for evaluating local aquaculture impacts in relation to the structuring of the species into populations. Some of the information collected is being used to assist with retrospective assessments of the direct genetic impacts of farm escapes on wild gene pools on the West Coast of Scotland. The results of such studies advance both specific and general understanding and build informative individual based genetic and demographic predictive models for extending general understanding of the demographic consequences of interbreeding of farm escapes with wild populations. In recognition of the key importance of understanding the actual

levels of gene introgression from farm escapes, major efforts have been put into gaining funding to develop cost-effective generic molecular methods differentiating farm and wild salmon and their hybrids that would make this possible e.g. 2008 EU AQUAKIT application.

The TWG commissioned a report from Strathclyde University to review strategic sea lice control within TWG Area Management Agreements. This report uses a case-study based method to assess the extent to which datasets currently generated within TWG AMAs can be used to evaluate the impact of co-ordinated management on sea lice infestations. An in-depth study was undertaken using data provided by the West Loch Tarbert Area Management Group. A further, less detailed, analysis was performed using data made available through some partner members of the Linnhe/Lorn/Etive/Sound of Mull/Sunart AMA.

An illustrative list of relevant research arranged according to the headings in Annex 7 of the Williamsburg resolution can be found at Annex 5 of this FAR.

2.12 Educational materials should be developed and distributed to increase awareness of the risks that introductions and transfers of aquatic species may pose to wild salmon stocks and the need for measures to control these activities.

Fisheries managers, anglers and other stakeholders are regularly made aware of the risks that introductions and transfers may pose to wild salmon stocks and the need for measures to control these activities through a variety of measures including:

- Presentations by Scottish Government scientists at meetings of the Scottish Freshwater Fisheries Forum, Fisheries Trusts, Salmon Fishery Boards and aquaculture organisations;
- Press releases, display and poster materials at major public events such as the Scottish Game Fair
(http://www.frsscotland.gov.uk/Delivery/News/display_newsitem.aspx?contentid=3094);
- Guidance on the control of introductions and transfers under the Aquaculture and Fisheries (Scotland) Act 2007
(http://www.opsi.gov.uk/legislation/scotland/acts2007/pdf/asp_20070012_en.pdf)
- Reports and information leaflets highlighting issues relating to introductions, transfers, stocking and restoration of salmon rivers, for example:
 - Hatchery work in support of salmon fisheries
(http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/SFRR_65.pdf)
 - Restoration guidance for west coast salmon and sea trout fisheries
[<http://www.tripartiteworkinggroup.com>]
 - Scotland's freshwater fish populations: introductions and movements
(<http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/FW11Scotlands.pdf>)
 - Scotland's freshwater fish populations: stocking, genetics and broodstock management

- (<http://www.frs-scotland.gov.uk/Uploads/Documents/FW13Scotlands.pdf>)
- Salmon and sea trout: to stock or not?
- (<http://www.frs-scotland.gov.uk/Uploads/Documents/Stocking.pdf>)
- A code of practice to avoid the introduction of *Gyrodactylus salaris* to Great Britain (<http://www.frs-scotland.gov.uk/Uploads/Documents/CoPGyrod.pdf>)
- Keep fish diseases out: a guide to protecting freshwater fish stocks from gyrodactylosis and other serious fish diseases (<http://www.frs-scotland.gov.uk/Uploads/Documents/General%20Leaflet%20very%20latest!.pdf>)
- Strategic Sea Lice Control (<http://www.tripartiteworkinggroup.com>)
- Homarus Report on “Research into the Costs and Benefits of Tripartite Working Group Area Management Agreements” (<http://www.tripartiteworkinggroup.com>)

In addition, Codes of Good Practice in Fisheries Management and Stocking are currently being developed under the Strategic Framework for Scottish Freshwater Fisheries (2008). <http://www.scotland.gov.uk/Publications/2008/06/26110733/0>

As part of an on-going publicity campaign, information leaflets and posters have been produced and widely circulated about the risks of importing *Gyrodactylus salaris* into Scotland. A Contingency Plan is regularly updated and maintained on the Scottish Government website. Training exercises involve a wide range of stakeholders and government officials have regularly attended river treatments in Norway and used information gained to enhance Scotland’s preparedness. A DVD has been produced using information gained in Norway to alert the public to the dangers of importing *Gyrodactylus salaris*. The SSPO also plays a role in keeping its members aware of issues around *Gyrodactylus salaris* through the distribution of publicity material, items included in technical reports and seminars for members.

ASFB, RAFTS and Scottish Government funded and produced riverbank signage to support the Gs prevention strategy. Allied to this, supplies of disinfectant were distributed to the DSFBs and Trusts to ensure that anglers have facilities to disinfect fishing tackle and clothing where necessary. Bio-security plans are currently being developed through a project being led by RAFTS and Gs will be included in these. Many proprietors of fisheries are also alerting anglers to the dangers of infection with Gs and providing disinfection facilities as are some fishing tackle shops.

GLOSSARY OF ACRONYMS

Acronyms

| | |
|--------|--|
| AA | Appropriate Assessment |
| AMA | Area Management Agreement |
| AMG | Area Management Group |
| ASFB | Association of Salmon Fishery Boards |
| BIP | Border Inspection Post |
| BKD | Bacterial Kidney Disease |
| CoGP | Code of Good Practice |
| CAR | Controlled Activities Regulation |
| DSFB | District Salmon Fishery Board |
| EFTA | European Free Trade Association |
| EIA | Environmental Impact Assessment |
| FASMOP | Focussing Atlantic Salmon Management on Populations: a partnership research programme between RAFTS, Marine Scotland and individual DSFBs and Fisheries Trusts |
| FCI | Food Certification International |
| FEPA | Food and Environmental Protection Act |
| FHI | Fish Health Inspectorate |
| Gs | Gyrodactylus salaris |
| HFSWG | Healthier Fish and Shellfish Working Group |
| ILFA | Import of Live Fish Act 1980 |
| ISFA | International Salmon Farmers' Association |
| MGA | Ministerial Group on Aquaculture |
| MS | Marine Scotland |
| MSS | Marine Scotland Science |

| | |
|-------|--|
| NEAC | North East Atlantic Commission |
| RAFTS | Rivers and Fisheries Trusts of Scotland |
| RDO | Regional Development Officer for TWG |
| ROAME | Marine Scotland Science acronym for research projects: “Rationale, Objectives, Appraisal, Monitoring, Evaluation” |
| RSG | Regional Steering Group for TWG |
| SAC | Special Area of Conservation designated under EU Habitats Directive |
| SARF | Scottish Aquaculture Research Forum |
| SEPA | Scottish Environment Protection Agency |
| SG | Scottish Government |
| SNH | Scottish Natural Heritage |
| SOPs | Standard Operating Procedures |
| SSPO | Scottish Salmon Producers’ Organisation |
| SSSI | Site of Special Scientific Interest designated by Scottish Natural Heritage to protect the best of Scotland’s natural heritage |
| TWG | Tripartite Working Group |
| VMD | Veterinary Medicines Directorate |

List of relevant Scottish, UK and EU legislation

The Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003
http://www.opsi.gov.uk/legislation/scotland/acts2003/asp_20030015_en_1

The Aquaculture and Fisheries (Scotland) Act 2007
http://www.opsi.gov.uk/legislation/scotland/acts2007/asp_20070012_en_1

The Town and Country Planning (Scotland) Act 1997 (as amended by the Planning etc (Scotland) Act 2006). http://www.opsi.gov.uk/acts/acts1997/ukpga_19970008_en_1

The Scotland Act 1998 (River Tweed) Order 2006
http://www.opsi.gov.uk/si/si2006/uksi_20062913_en.pdf

The Nature Conservation (Scotland) Act 2004
http://www.opsi.gov.uk/legislation/scotland/acts2004/asp_20040006_en_1

European Council Regulation 708/2007 Concerning The Use of Alien and Locally Absent Species in Aquaculture
http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=Regulation&an_doc=2007&nu_doc=708

Prohibition of Keeping or Release of Live Fish (Specified Species) (Scotland) Order 2003
<http://www.opsi.gov.uk/legislation/scotland/ssi2003/20030560.htm>

The Wildlife and Countryside Act 1981
<http://www.jncc.gov.uk/page-1377>.

The Code of Good Practice for Scottish Finfish Aquaculture:
<http://www.scottishsalmon.co.uk/dlDocs/CoGp.pdf> .

The Fish Farming Businesses (Record Keeping) (Scotland) Order 2008 (the 2008 Order)
http://www.uk-legislation.hmso.gov.uk/legislation/scotland/ssi2008/pdf/ssi_20080326_en.pdf

The Water Environment (Controlled Activities) (Scotland) Regulations 2005.
(<http://www.opsi.gov.uk/legislation/scotland/ssi2005/20050348.htm>).

Hatcheries registered with District Salmon Fishery Boards

Association of Salmon Fishery Boards Survey November 2009

Number of wild fish hatchery units in each salmon fishery district with approximate output of each unit

| District & no. of units | Numbers of Units | Hatchery details |
|---------------------------|------------------|---|
| Tay | 2 | Cromwellpark, Almondbank 1,000,000 to 3,000,000 eyed ova/unfed fry. Balloch, Comrie, Crieff up to 300,000, stocked as unfed fry and fed-on parr. |
| Spey | 2 | Sandbank hatchery , 80,000 fry Tulchan hatchery , 300,000 fry |
| Dee | 1 | Dess Tributary , 50,000 ova/fry |
| Deveron | 1 | Loch Park hatchery Drummuir , 280,000 fry |
| Kyle of Sutherland | 1 | Kincardine Hatchery , Ardgay, 255,000 unfed fry |
| Nith | 2 | Blackwood , 700,000 Fry Dalswinton , 600,000 fry |
| Don | 1 | Mill of Newe 400,000 Eyed Salmon Ova |
| Helmsdale | 1 | Old Kinbrace hatchery 150,000 fry |
| Cromarty | 2 | Contin Hatchery River Conon 600,000 eyed ova, 1,700,000 fry Novar Hatchery River Alness 12,000 fry |
| Western Isles | 3 | Creed River hatchery , approx 30,000, Eyed ova/fry Red River hatchery , approx 60,000 eyed ova/fry Langass hatchery , approx 100,000 fry |
| Northern | 1 | Halladale – output unknown |

| District & no. of units | Numbers of Units | Hatchery details |
|-------------------------|------------------|---|
| Beaully | 1 | Corff, Beaully, 180,000 fry |
| Doon | 1 | Craigengillan Estate 109,000 eyed ova, 336,000 fry |
| Lochaber | 4 | Drimsallie Hatchery 250,000 fry, 40,000 smolts, Dorlin Hatchery, Shiel 30,000 fry, Lochailort Hatchery, 30,000 fry, Kingairloch hatchery 30,000 fry |
| North & West | 1 | Rispond Estate, 15,000 sea trout juveniles |
| Annan | 1 | Rae Hills Home Farm, 350,000, eyed ova |
| Argyll | 8 | Blackmount Rivers Awe/Orchy - No output - Mothballed Glenkinglass-Loch Etive River Kinglass 20,000 salmon Dalness –River Etive 100,000 smolts Aray. Glen Aray River Aray: 15,000 unfed fry, River Kinglas: 15,000 unfed fry Arran Rivers Improvement Association: 5-10,000 sea-trout fry Arran Angling Club, Lamlash Hatchery - No output Machrie and Dougarie Estates: Dougarie Hatchery. Machrie: 36,000 unfed fry River Iorsa: 3,000 sea trout fry (swim up stage) and 5,000 salmon(unfed fry) River Ruel Improvement Association. Seafield: River Ruel. 2,000 fry |
| Brora | 1 | Gordonsbush Hatchery. 20,000 salmon smolts |
| Wester Ross | 1 | Seafield College, Kishorn, 5,000 salmon smolts – River Ewe 14,000 salmon fry – Kernsary River 1,000 salmon and 50,000 sea trout Applecross River 50,000 salmon fry River Runie 50,000 sea trout Loch Sguod |
| Girvan | 1 | Balbeg Estate, 1,000,000 fry |

| District & no. of units | Numbers of Units | Hatchery details |
|-------------------------|------------------|---|
| Urr | 1 | Dalbeattie, 60,000 Eyed Ova |
| Kirkcudbright Dee | 1 | Kentor 300,000 fry |
| Luce | 1 | Craigholly Farm 100,000 eyed ova |
| Bladnoch, Cree & Fleet | 1 | Gibb Hatchery, Wigtown. Bladnoch 42,000 eyed ova, 10,000 fry Cree 120, 000 eyed ova, 101,000 fry Fleet 7,000 sea trout eyed ova, ,7000 sea trout fry |
| Findhorn | 2 | Lethen hatchery, 500,000 fed fry Corrievorrie hatchery, 200,000 fed fry |
| Total Units | 42 | |

Source: Association of Salmon Fishery Boards, January 2010

Districts with no District Salmon Fishery Board

Number of salmon and sea trout stocked in Districts with no District Salmon Fishery Board over the period 1 August 2008 to 31 July 2009 under licence issued by Marine Scotland Science

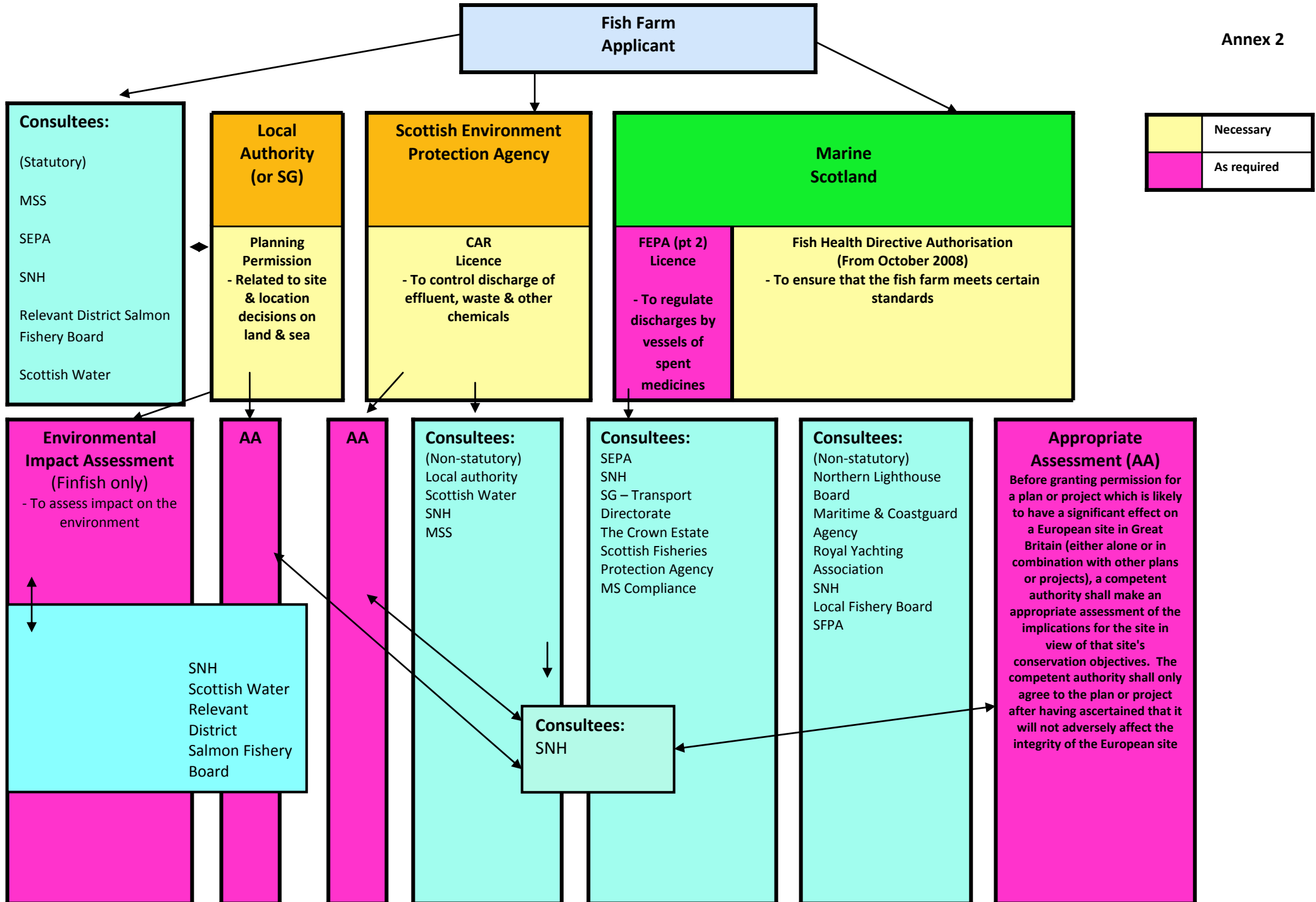
| Fishery District | Salmon | | | Sea trout | | |
|--------------------|----------------|---------|--------|----------------|---------|--------|
| | Eggs/unfed fry | Fed fry | Smolts | Eggs/unfed fry | Fed fry | Smolts |
| Carron | - | 150,000 | 8,000 | - | 380,000 | - |
| Clyde and Leven | 55,000 | 22,000 | - | 30,000 | - | 1,000 |
| Fleet (Sutherland) | - | - | - | - | 10,000 | - |
| Irvine | 150,000 | - | - | 20,000 | - | - |
| Loch Long | 30,000 | - | - | 10,000 | - | - |

In addition, small amounts of salmon material (total 690 unfed fry) were stocked in educational projects in Districts with no District Salmon Fishery Board

Source: Marine Scotland Science, January 2010

AQUACULTURE CONSENTS

Annex 2



Legislation and Guidance for Planning Decisions on Location of Fish Farms

1. The Aquaculture and Fisheries (Scotland) Act 2007

The Aquaculture and Fisheries (Scotland) Act 2007

http://195.99.1.70/legislation/scotland/acts2007/pdf/asp_20070012_en.pdf

introduced provisions regarding fish and shellfish farms, *Gyrodactylus salaris*, salmon and freshwater fisheries, and sea fisheries. Relevant to aquaculture, it allows inspection of finfish farms to assess whether satisfactory measures are in place for controlling parasites (sea lice) and for containing farmed fish and preventing escapes. The legislation was introduced in addition to the measures in the voluntary *Code of Good Practice for Scottish Finfish Aquaculture* to ensure that all fish farms adhere to certain minimum standards. Scottish Ministers have the discretion to serve enforcement notices where the measures are found to be insufficient or there are problems which need to be rectified.

Secondary legislation was required to enable the implementation of the Act. *The Fish Farming Businesses (Record Keeping) (Scotland) Order 2008* http://www.England-legislation.hmso.gov.uk/legislation/scotland/ssi2008/ssi_20080326_en_1 sets out the records which must be compiled and retained by fish farming businesses for each site where they farm fish, in relation to the control and treatment of sea lice and the containment of fish. The Order came into force on 10 November 2008. Under the powers in the Act, Marine Science Scotland (MSS) Fish Health Inspectorate assumed the role of Inspectorate and reporting body.

MSS has developed an inspection regime and associated inspector's guidance including investigation and audit report checklists, in parallel with the development of the Record Keeping Order. The inspection regime encompasses a risk-based and intelligence-based approach involving both inspections and audits. They include analysis of sea lice records and inspection of stock for sea lice; a visual assessment of the site to look for any containment issues and enquiry into the causes of previous escapes. Containment audits involve analysis of record keeping, site integrity and operational practices in relation to the risk of an escape of fish. An inspection may recommend a site for more detailed investigation through an audit. Up to 10% of sites will be audited annually, this equates to about 30 seawater sites for sea lice and about 50 sites (freshwater and seawater) for containment.

Section 6 of the Act allows for the issuing of enforcement notices. Prosecution is an option under this legislation but the focus will be on working with the industry to improve conditions on sites for its own benefit and the benefit of the wider environment. Good practice dictates MSS should agree an enforcement procedure which involves issuing advice verbally and formally in writing with follow-up inspection as and when necessary, prior to taking action through the issuing of any Enforcement Notices. A programme of inspections and audits commenced in November 2008.

2. Reporting of fish farm escapes

The Registration of Fish Farming and Shellfish Businesses Amendment Order 2002 and the succeeding Registration of Fish Farming and Shellfish Farming Businesses Amendment (Scotland) Order 2008 require fish farmers to notify Scottish Ministers, in writing, of escapes, or when there is cause to suspect that there is a significant risk that an escape may have occurred. 'Significant risk' is not defined in the Order but examples may include: a tear in the net and/or the presence of fish in the immediate vicinity of the farm site which may be farmed fish.

Following the introduction of the EU Aquatic Animal Health Directive 2006/88/EC, implemented in Scotland through the Aquatic Animal Health (Scotland) Regulations 2009 the reporting of Fish Farm Escapes or events which may have given rise to an escape of fish are a condition of authorisation. The reporting of escapes from fish farms is also a requirement of the industry CoGP – point 4.9.7.2.

In the event of a suspected escape, the farm operator will check site integrity and/or undertake counts, depending on the circumstances, and subsequently notify the Scottish Government if they believe an escape has occurred. Operators are also required in the Code of Good Practice to alert local wild fish interests to possible escapes, although this is not a statutory obligation. Every suspected escape is investigated by the Scottish Government. This initially involves contact with all the farms in the locality and, if deemed necessary, follow-up site inspections by Marine Scotland Science (MSS) Fish Health Inspectorate. Non-reporting of an escape is an offence attracting a maximum fine of £2,500. However, an operator is only obliged to notify Scottish Ministers if they believe an escape has occurred from their site or there is significant risk that an escape has occurred.

3. Aquaculture Planning

This section provides a summary overview of the various approvals required by the aquaculture industry in Scotland in order to operate.

Aquaculture in the marine environment is regulated by local authorities and the Scottish Environment Protection Agency using the same tools and processes as those applied in land-use planning (but adapted where appropriate to address marine issues) and discharge control. Marine Scotland Science (MSS) has also played a part regulating aquaculture on fish disease and cumulative effects from nutrients, etc, under locational guidelines procedures. Since the introduction of the Aquaculture and Fisheries (Scotland) Act 2007 the role of MSS has increased encompassing new areas of regulation including fish farm containment and farmed fish escapes, sea lice control, and the movement of fish in inland waters. Marine aquaculture is at present a coastal activity and the finfish cages have to be placed in relatively sheltered coastal sea lochs, sounds and voes to provide them with protection against the type of waves generated in ocean storms.

The major items of legislation which apply to aquaculture planning are:

EU Aquatic Animal Health Directive

The Aquatic Animal Health (Scotland) Regulations 2009 implement the EU Aquatic Animal Health Directive. Authorisation is granted to an Aquaculture Production Business (APB) where MSS, on behalf of the Scottish Ministers, are satisfied that the operation of the farm does not pose an unacceptable risk of spreading disease to other farms or to wild fish stocks. Conditions of authorisation exist which the farm must meet in order to maintain its authorisation. Serious non-compliance with the conditions of authorisation could result in formal Enforcement Notices, prosecution and the revocation of a farm's authorisation to operate.

Town and Country Planning (Scotland) Act 1997

Planning permission is required from planning authorities under this Act for fish farm developments in inland waters.

Local authorities are usually the 'planning authority' for an area and their responsibilities include preparing development plans, deciding on most applications for planning consents and taking action against development that has been carried out without consent.

The local authority planning permission process covers the impacts on people or their activities, mainly noise, visual intrusion and freshwater fisheries in the area. But, through the current Environmental Impact Assessment (EIA) process, local authorities can and do consider navigation and the effects on the aquatic environment.

Scottish Planning Policy 22 *Planning for Fish Farming*

Scottish Planning Policy 22 sets out Scottish Government planning policy for planning authorities and others on both marine and freshwater fish farming. It states that the effects on other fishing (including wild) interests should be fully considered in reaching a decision on a planning application. It provides guidance on a range of bodies from whom advice could be sought.

The Town and Country Planning (General Development Procedure) (Scotland) Order 1992

This order sets out procedures on who should be statutorily consulted on planning applications and in what circumstances.

Environmental Impact Assessment (Scotland) Regulations 1999 (as amended)

These regulations require that any assessment should include the impact of any development on wild fish.

Nature Conservation (Scotland) Act 2004

This Act places a duty on every public body, in exercising any of its functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions.

The Conservation (Natural Habitats, &c.) Regulations 1994

An appropriate assessment has to be undertaken by a planning authority if any proposed development which is likely to have a significant effect on the interests for which a Special Protection Area (species) and/or Special Area of Conservation (habitats) was designated.

Water Environment and Water Services (Scotland) Act 2003

Controlled Activity Regulations (CAR) Authorisation

In determining licence applications for marine cage fish farms, SEPA sets limits upon the scale and rate of discharges from fish farm sites such that the effluent arising is assimilated and broken down by natural processes as it is discharged, ensuring no lasting impacts or lasting accumulation of pollutants.

The aim of the licensing system for fish farms is to ensure adequate protection of the seabed and wider ecosystem of the waters in which such farms are situated.

Monitoring of the marine environment is undertaken both on behalf of the operator and by SEPA staff to ensure that any impacts occurring at marine cage fish farm sites are within acceptable limits. In addition, regular inspections are undertaken by SEPA staff to audit site records, assess the operation of the site and further measure compliance with the site licence.

Movements of viable Atlantic salmon and their Gametes

| Stage & Origin | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|----------------------|-----------|-----------|------------|------------|------------|------------|------------|
| Ova | | | | | | | |
| Australia (Tasmania) | 550,000 | 1,860,000 | - | 2,400,000 | - | - | - |
| Iceland | 9,518,000 | 3,475,000 | 570,000 | 300,000 | - | - | - |
| Norway | 2,900,000 | 6,750,000 | 13,210,000 | 15,940,000 | 33,555,000 | 22,702,725 | 21,755,500 |
| Republic of Ireland | 7,820,000 | 4,450,000 | 2,610,000 | 11,575,000 | 10,511,000 | 5,600,000 | 5,460,000 |
| USA | 400,000 | 450,000 | 450,000 | - | - | - | - |
| Parr | | | | | | | |
| Republic of Ireland | 325,000 | 541,000 | - | 272,000 | 420,000 | - | 60,000 |
| Smolts (SW) | | | | | | | |
| Republic of Ireland | 325,000 | 541,000 | - | 272,000 | 420,000 | - | 60,000 |
| Broodfish | | | | | | | |
| Republic of Ireland | - | - | - | - | - | - | - |
| | - | 750 | - | - | - | - | - |

Imports of Atlantic salmon

Imports of Atlantic salmon milt from Norway has occurred but the milt that is imported is originally exported from Scotland and cryogenically frozen until required.

Imports of rainbow trout

| Stage & Origin | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---------------------|------------|------------|-----------|------------|------------|------------|-----------|
| Ova | | | | | | | |
| Australia | 0 | - | 2,600,000 | 1,500,000 | - | - | - |
| Denmark | 5,270,000 | 6,370,000 | 9,225,000 | 14,525,000 | 13,070,000 | 5,530,000 | 4,070,000 |
| France | 875,000 | 800,000 | 200,000 | - | - | - | - |
| Isle of Man | 6,855,000 | 8,012,000 | 1,700,000 | 3,480,000 | 3,767,000 | 775,000 | 290,000 |
| Northern Ireland | - | 405,000 | 1,710,000 | 2,830,000 | 7,721,000 | 16,130,000 | 9,940,000 |
| Norway | - | - | - | 500,000 | 1,200,000 | 1,500,000 | - |
| South Africa | 50,000 | - | - | - | 485,000 | - | - |
| USA | 11,035,000 | 17,335,000 | 4,440,000 | 2,310,000 | 890,000 | 1,490,000 | 1,780,000 |
| Juveniles | | | | | | | |
| Isle of Man | - | 25,000 | - | - | - | - | - |
| Northern Ireland | 200,000 | 280,000 | - | - | 18,000 | 32,000 | - |
| Republic of Ireland | 134,000 | - | 214,000 | - | - | - | - |
| Adults | | | | | | | |
| Northern Ireland | 38 | - | 518 | 350 | - | 500 | - |

Imports of other salmonids

| Species, stage & destination | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|------------------------------|------|------|--------|------|--------|------|--------|
| Arctic charr | | | | | | | |
| Ova | | | | | | | |
| Italy | - | - | 65,000 | - | - | - | - |
| Brown trout | | | | | | | |
| Ova | | | | | | | |
| Kenya | - | - | - | - | 20,000 | - | - |
| Denmark | - | - | - | - | - | - | 20,000 |

Annex 5

Illustrative list of research in support of Annex 7 of the Williamsburg Resolution

The following is an illustrative list of relevant research at the behest of the Scottish Government, sometimes in collaboration with the wild fish and/or aquaculture industries.

Sterile Fish

Production and performance of triploid Atlantic salmon in Scotland has been investigated and reported by Johnstone (1992) <http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/sarr2.pdf>

Tagging and marking

A collaborative study has been carried out to investigate the dispersal of large farmed Atlantic salmon from simulated escapes at fish farms in Norway and Scotland (Hansen and Youngson 2009: Fisheries Management and Ecology, in press). The study established the capacity for long distance dispersal among escapees from aquaculture facilities and suggested a net easterly bias in long distance dispersal of salmon escaping from Scottish fish farms.

Evaluation of production methods

SARF has published the following research:

[SARF023 - A review of the sea lice bath treatment dispersion model used for discharge consenting in Scotland](#)

[SARF027 - Research and development of stock management strategies to optimise growth potential in ongrowing of marine finfish](#)

Aquaculture broodstock

Commercial research is underway in Scotland into the development of triploid strains and into disease and sea lice resistant strains of salmon.

Genetics

Studies are underway to delineate intra-specific biodiversity in relation to the division of the species into sub-specific taxa, functionally and evolutionarily distinct regional stock groups, meta-populations and distinct breeding populations within and among rivers; this work is being carried out under Marine Scotland Science research projects SF0271, SF0279, the RAFTS-Marine Scotland Science collaboration Focusing Atlantic Salmon Management on Populations (FASMOP), and the international EU and partnership funded and NASCO sponsored SALSEA-MERGE projects. This work is providing baseline information which can be used for evaluating local aquaculture impacts in relation to the structuring of the species into populations. Some of the information collected is being used for retrospective

assessments of the direct genetic impacts of farm escapes on wild gene pools on the west coast of Scotland. The results of such studies will advance both specific and general understanding and build informative individual based genetic and demographic predictive models for extending understanding of the consequences of interbreeding of farm escapes with wild populations. In recognition of the key importance of understanding the actual levels of gene introgression from farm escapes, major efforts have been put into developing international collaboration to develop cost-effective generic molecular methods differentiating farmed and wild salmon and their hybrids that would make this possible. Funding was sought for this work in 2008 (EU AQUAKIT application) but was unsuccessful.

Diseases and parasites

Marine Scotland Science has developed a bio-physical model of planktonic sea louse dispersal for the Loch Torridon area. The model can predict the transport of sea lice larvae and produce maps of infectivity under different environmental conditions. The results from the model are being validated using larval counts from coastal and offshore sample stations and by the use of sentinel cages to measure the infection pressure on salmonids. Work is also underway to test this model in other locations.

Geographical variations in lice burdens of wild sea trout, and the link to production on local farms, are being investigated on the West Coast of Scotland. In addition, an investigation into the return rates of sea trout from the River Shieldaig, and the links with fish farming, are ongoing.

SARF has published the following research on these issues:

[SARF001 - Prevention and management of *Ichthyophthirus multifiliis* \(Whitespot\) - project completed.](#)

[SARF004 - Vaccine performance/efficacy in gadiods measured by cell mediated immune responses](#)

[SARF015 - The aetiology and epidemiology of PD, HSMI and CMS in Scotland](#)

[SARF016 - A study of the aetiology and control of Rainbow Trout Gastro Enteritis \(RTGE\)](#)

[SARF028 - Development of a scheme for monitoring sentinel farms in the UK trout industry](#)

[SARF041 - Developing practical strategies for reducing the spread of harmful organisms during the transportation of live fish](#)

Interactions

The numbers of escaped farmed salmon captured in Scottish rivers are recorded, analysed by district and published annually in the Statistical Bulletin of Scottish Salmon and Sea Trout Catches

<http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/SCSB08.pdf> .

SARF has published the following research on this issue:

[SARF022 - Novel species risk to biodiversity assessment study: as discussed within the Scottish Biodiversity Implementation Plans - project completed](#)

Risk assessment frameworks

SARF has published a number of pieces of research on these issues:

SARF003 - Development of a GIS - based tool to assist planning of aquaculture developments - project completed.

SARF005 - Site optimisation for aquaculture - project completed.

SARF012 - The development of modelling techniques to improve predictions of assimilative capacity of water bodies utilised for marine caged fish farming

SARF014 - final report

SARF015 - The aetiology and epidemiology of PD, HSMI and CMS in Scotland

SARF016 - A study of the aetiology and control of Rainbow Trout Gastro Enteritis (RTGE)

SARF017 - Identifying the risk of deoxygenation in Scottish Sea Lochs with isolated deep water - project completed

Biological impacts

Research in Scotland on biological impacts has included investigations of the fate of farm escapees, spawning distribution and behaviour of farmed salmon in rivers, competition and interbreeding with wild fish, and studies on the proportion of salmon ova in rivers of farmed origin (see Verspoor, E, Stradmeyer, L and Nielsen L (eds.) 2007: The Atlantic Salmon: Genetics, Conservation and Management, 357-398, Blackwell Publishing.

<http://www3.interscience.wiley.com/cgi-bin/bookhome/116844548?CRETRY=1&SRETRY=0>

SARF has published the following research on these issues:

SARF009 - Coastal assimilative capacity for amalgamated fish farm chemicals/organic pollutants.

SARF011- Review of Environmental Quality Standards (EQSs) for use in assimilative capacity model development

SARF026 - Evaluation of the impact of copper released to the environment from the marine cage fish farms

SARF036 - A review and assessment of the effects of marine fish farm discharges on Biodiversity Action Plan habitats

ESCAPES PREVENTION

SARF044 - Assessment of the impacts and utility of acoustic deterrent devices

Sea lice: Summary of actions agreed in the Williamsburg Resolution

| | Sea lice | Position in Scotland |
|---|---|---|
| International Goals | 100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms. | Sea lice management is currently covered by TWG and CoGP requirements as well as the relevant fish welfare legislation. Section 2.4.4 describes the planned action of the Health Working Group (HWG) to strengthen the regulatory regime further. |
| | <i>Use Williamsburg Resolution as basic guidance, supplemented as below.</i> | |
| Best Management Practices (BMPs) | Area management, risk-based, integrated pest management (IPM) programmes that meet jurisdictional targets for lice loads at the most vulnerable life-history stage of wild salmonids. | CoGP includes provisions to ensure this occurs. HWG working to delineate more appropriate scale management areas, and to ensure Area Management Agreements (AMAs) are in place everywhere in Scotland. |
| | Single year-class stocking | This is recommended in the CoGP and will become the standard following adoption of the HWG recommendations. |
| | Fallowing | This is recommended in the CoGP and will become the standard following adoption of the HWG recommendations. |
| | Risk-based site selection | Already in place – see section 2.3. |
| | Trigger levels appropriate to effective sea lice control. | Already in place in CoGP – currently being reviewed. |
| | Strategic timing, methods and levels of treatment to achieve the international goal and avoid lice resistance to treatment. | Under consideration by HWG. |
| | A comprehensive and regulated fish health programme that includes routine sampling, monitoring and disease control. | Already in place – see section 2.4.4. |
| | Lice control management programmes appropriate to the number of fish in the management area. | Requirements already in place in CoGP, under review by HWG. |
| | Adaptive management in response to monitoring results to meet the goal. | Control regimes are designed to give fish farm operators the scope to try new approaches to management, underpinned by the science. |

| | | |
|--|---|---|
| Reporting and Tracking | Monitoring programme appropriate for the number of farmed salmon in the management area and sampling protocols effective in characterising the lice loads in the farms and wild salmonid populations. | Current controls are described in section 2.1, planned strengthening of such controls at 2.4.4. |
| | Lice loads on wild salmonids compared to areas with no salmon farms. | Research on this has recently been published by Marine Scotland Science. |
| | Lice-induced mortality of salmonids (eg as monitored using sentinel fish, fish-lift trawling, using batches of treated smolts). | Research is in progress, and additional studies planned. |
| | Monitoring to check the efficacy of lice treatments. | Monitoring of the efficacy of lice treatments will become obligatory, with reporting of treatment failures to Marine Scotland Science. |
| Factors Facilitating Implementation | Development of a monitoring programme appropriate for the number of farmed salmon in the management area and sampling protocols effective in characterising the lice loads in the farms. | Legislative requirements to sample and record parasites. CoGP specifies protocols for lice counts and co-ordinating monitoring and treatment activities in defined areas. |
| | Access to a broad suite of therapeutants, immunostimulants and management tools. | Aquaculture Industry – treatment schemes, resistance issues. Pharmacological Industry – research and applications for approval. SEPA – Discharge consents. VMD – approval of medicines. |
| | Coalition and assessment of site selection and relocation criteria. | The Scottish Government’s Location-Relocation Working Group has been rolled forward into development of the Strategic Framework for Scottish Aquaculture. |
| | Regulatory regimes which facilitate availability of alternative sites, as necessary, to support achievements of the goal. | Scottish Planning Policy 22 sets out planning policy in relation to fish farms and the effects that need to be considered. |
| | Training at all levels in support of the goal and to increase awareness of the environmental consequences of sea lice. | Legal requirement to keep record of all training. |
| | Monitoring of lice levels: in areas with and without farms; before, during and after a farm production cycle; and in plankton samples. | Sea lice data on salmon farms are inspected annually by Marine Scotland Science. In addition sea lice levels on wild salmonid fish are monitored at a number of locations on the Scottish west coast under the aegis of the Tripartite Working Group. |

Containment: Summary of actions agreed in the Williamsburg Resolution

| | Containment | Position in Scotland |
|---|---|---|
| International Goals | 100% farmed fish to be retained in all production facilities | Approximately 99.8% in 2008 (58,641 escaped fish from approx 30,480,000 fish in production) |
| | <i>Use Williamsburg Resolution as basic guidance, supplemented as below</i> | |
| Best Management Practices (BMPs) | Codes of Containment including operating protocols | <p>Included in Code of Good Practice for Scottish Finfish Aquaculture (now under revision) – covering most operators (by volume) in Scotland;</p> <p>Many large businesses have company specific Standard Operating Procedures;</p> <p>Marine Scotland Science Inspections under the Aquaculture & Fisheries Scotland Act 2007 for satisfactory measures in place to contain fish and prevent escapes as defined in the “Record Keeping Order 2008” – all farms could be subject to investigation or audit.</p> |
| | Technical standards for equipment | <p>Equipment should be fit for purpose and installed as per manufacturers’ instruction.</p> <p>Scotland to develop a Scottish standard, including for equipment deployed in freshwater.</p> |
| | Verification of compliance | <p>Fish farms audited by FCI for compliance with Industry Code of Practice;</p> <p>Fish farms audited by MSS (FHI) for compliance with Record Keeping Order</p> |
| | Risk-based site selection | Environmental Impact Assessment & Appropriate Assessment. |

| | | |
|---------------------------------|---|---|
| | Mandatory reporting of escapes and investigation of causes of loss | Causes of all escapes currently investigated by Marine Scotland; Improved containment subgroup considering establishment of escapes committee. |
| | Adaptive management in response to monitoring results to meet the goal | Delivered through: <ul style="list-style-type: none"> • Company specific training • Revision of Industry Code of Practice • FHI feedback to operators and other inspectors • Improved Containment Working Group established. • Updating regulatory regime. |
| Reporting & Tracking | Number of incidents of containment breach and standardised descriptions of the factors giving rise to escapes | Every escape must be reported by the farming business to Scottish Government on an Initial Escapes Notification form. This must be followed up (within 28 days) with a Final Escapes Notification form. Information required includes; date and time of incident, site name, OS grid reference, company name, species, age in months, size of fish, average weight, growth stage, health status, water type, weather conditions, number of fish escaped, cause of escape – currently categorised as hole in net, predator, equipment failure, weather/flooding, vandalism, human error or unknown. |

| | | |
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| | | <p>Information is held by Marine Scotland on a database called Aquadat.</p> <p>All confirmed escapes are published on the Scottish Government website at http://www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18692/escapeStatistics</p> <p>Published data includes; date of incident, site name, company name, species, water type, size of fish, no of fish escaped, cause of escape (as detailed above).</p> <p>The published tables of escapes statistics are updated after every escape (once the final notification has been received and processed).</p> <p>Escapes are also published in the Marine Scotland – Scottish Fish Farms Annual Production Survey, which is available on the Marine Scotland Science Website at http://www.frs-scotland.gov.uk/</p> |
| | Number and life-stage of escaped salmon (overall number; % of farmed production) | <p>Number and life stage reported on notification forms and recorded as above.</p> <p>Total production and total number of escapes recorded and reported annually in Marine Scotland production survey as above.</p> |
| | Number of escaped salmon in both rivers and fisheries (overall number; % of farmed production) and relationship to reported incidents | <p>Number of escaped salmon caught in the wild fisheries reported in annual catch statistics.</p> <p>Total production reported annually in Marine Scotland production survey as above.</p> |
| Factors Facilitating Implementation | Monitoring of rivers for escapes | Through the Marine Scotland Science Freshwater Laboratory and investigation of report incidents. |
| | Site appropriate technology | Farms audited annually by MSS FHI under the 2007 Act for measures in place to contain fish, prevent escapes and recover escaped fish. Development of a Scottish technical standard through the Fresh Start Improved Containment Working Group. |

| | | |
|--|--|---|
| | <p>Advanced permitting to facilitate recapture and exchange of information on effectiveness of recapture efforts</p> | <ul style="list-style-type: none"> • Farms audited annually by MSS FHI under the 2007 Act for measures in place to recover escaped fish. • Legislation in place to allow for temporary deployment of monofilament gill nets to recapture escaped fish when appropriate. Recovery action and effectiveness recorded on escapes notification form. • Mitigation of escapes working group established through the Fresh Start Improved Containment Working Group comprising SG, industry and wildfish interests to improve communication and share information on escape events including best practice guidance. |
| | <p>Technology development (e.g. cage design, counting methods for farmed salmon, methods to track origin of escaped salmon and their progeny)</p> | <ul style="list-style-type: none"> • Development of a Scottish technical standard through Fresh Start Improved Containment Working Group. • Mitigation of Escapes Working Group established through the Fresh Start Improved Containment Group comprising SG, industry and wild fish interests to consider traceability of escapees. |
| | <p>Training at all levels in support of the goal and to increase awareness of the environmental consequences of escapes</p> | <ul style="list-style-type: none"> • Skills Development Working Group established through the Fresh Start Improved Containment Group |
| | <p>Assessments of the relative risks to the wild stocks from escapes from freshwater compared to marine facilities and from large but infrequent escape events compared to small but frequent escape events.</p> | <ul style="list-style-type: none"> • This work is currently being considered by the Improved Containment Working Group, ahead of commissioning additional research. |