



**SCOTTISH ENVIRONMENT PROTECTION  
AGENCY**

**POLICY NO 40**

**Fish Farming Advisory Group**

**Policy On Regulation And Expansion Of Caged Fish  
Farming Of Salmon In Scotland**

**(As agreed at the Board Meeting held on 29<sup>th</sup> August, 2000)**

**This policy can be found on SEPA's Intranet, on the Policy Bulletin  
Board or in copies of the Procedures Manual on Regulation and  
Monitoring Marine Cage Fish Farming in Scotland.**

**Version 1.0  
September, 2000**

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| <b>Status: Current      Restriction: none</b>  | <b>Authorised By: Chief Executive</b>  |

## 1. Purpose

This paper details the policy update on SEPA's regulation of the expansion of marine caged fish farming of salmon in Scotland.

## 2. Consultation

The policy has been approved by the Agency Board on 29<sup>th</sup> August, 2000 and has been considered by the Corporate Management Team following discussion by the Fish Farm Advisory and Policy Groups both before and after receiving comments from the Scottish Executive on an earlier draft provided to them. The proposed recommendations were also discussed with industry representatives at one of their regular scheduled meetings with SEPA representatives on 24<sup>th</sup> August, 2000.

## 3. Background

Several factors have come together to necessitate a review of SEPA's existing policies for determining applications to increase production at established fish farm sites or to commission new fish farm sites. In 1997 SEPA took initiatives to consult widely on the main issues surrounding the environmental effects of the industry, before drafting a procedures manual on the regulation and monitoring of the industry. Since then, fish farming has continued to develop steadily in Scotland, embracing new technologies and experimenting with the culture of new species. The structure of the industry is in a constant state of flux and development decisions are inevitably driven by economics as it strives to be competitive in a global market. Its make-up is progressively moving from the small to medium enterprise business sector to that dominated by a few large [often multi-national] companies and decisions on production and employment may often now be taken out-with the communities in which the farms are situated. At the same time, the industry has had to react to pressures brought to bear from the outbreak of infectious salmon anaemia virus [ISA] and growing public concern over environmental impacts.

For a number of reasons fish farmers are increasingly making application to be granted further production capacity at their existing sites. Only very occasionally are applications now made to establish new sites.

### **3.1 Issues Associated With Expansion**

The industry [or at least a substantial proportion of it] sees the installation of automated feeding systems as the way ahead, making better use of expensive feed by responding to the appetites of the fish and thus minimising waste. Automated feeding systems require substantial capital investment and are justified only where large scale production can be achieved thus focusing pressure on existing units to rear a higher biomass.

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Another factor in favour of increasing production at existing sites is the increasing difficulty in securing leases at new sites. The Scottish Executive has published a Policy Guidance Note: Locational Guidelines for the Authorisation of Marine Fish Farms in Scottish Waters which presumes against the expansion of fish farms into substantial sections of coastline, notably the east and north coasts, while placing significant restrictions on the development of new sites in areas originally defined as very sensitive or sensitive but now designated as Categories 1 and 2. This guidance is primarily aimed at the planning agencies.

A third important factor inhibiting the development of new sites is the active and persistent lobby which challenges further development in almost every situation. Real issues exist about the environment's capacity to cope with present and future husbandry practices but the arguments put forward are becoming increasingly confrontational and emotive, resorting to "sound bites" and hard-hitting media articles often with limited scientific credibility and this has the effect of limiting opportunities for constructive dialogue.

### **3.2 Other constraints**

Deposition of organic waste on the seabed close to fish cages is unavoidable and, in permitting this method of culture, some degree of impact must be accepted. The waste consists of uneaten food and faeces which settle to the sea bed in the vicinity of the cages. This material is readily biodegradable and in more energetic areas may be dispersed and assimilated by the benthic fauna with relatively little detectable accumulation or impact. In lower energy areas the sea bed may become enriched with organic carbon promoting anoxia and causing local but severe distortions in sediment chemistry and the structure of the benthic fauna (predictably lower species variety and increased numerical abundance) and formation of bacterial films (*Beggiatoa sp.*) on the sediment surface. Where heavy deposition is restricted to a confined area increased sulphate reduction may cause out-gassing which has been found to have a detrimental effect on fish health in the cages above. Setting limits on the "size" of a cage fish farm is achieved by setting a limit on the maximum weight of fish (or biomass) that can be held at any time and a range of techniques is used together by SEPA in an attempt to match the maximum tonnage with the environment's capacity to assimilate the waste arising. At very large farms or those inappropriately sized to their location, the sea bed may be affected in this way to an extent which SEPA is unwilling to accept as compatible with a sustainable and recuperative environment. SEPA will continue to develop and refine techniques for predicting likely benthic impact as an aid to setting appropriate consent conditions and will take action to improve coastal waters downgraded according to SEPA's coastal waters classification scheme.

There is also a growing debate on nutrients released from the metabolism and breakdown of fish farm food allegedly upsetting the natural balance of semi-enclosed systems. It has been alleged that this may be linked with the development of harmful algal blooms [HABS] which lead to consequent limitations on the harvesting of commercial shellfish crops. According to scientists at the Marine Laboratory, Aberdeen the incidence of HABS does not match the distribution of fish farming

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activities. Over the wide area of the Minch and the Sea of the Hebrides fish farming is estimated to contribute less than 1% of the nitrogen input entering these inshore waters. SEPA would wish to see the development of a more robust method to predict fully the impact of the very large units being proposed, particularly in quiescent lochs or voes where dilution and dispersion mechanisms are weakest and flushing times are relatively long. In the meantime, SEPA is aware that the categorisation of lochs and voes within the locational guidelines referred to above includes an indexing of relative levels of nutrient enhancement.

One of the major difficulties facing the industry is the proliferation of sea-lice in marine salmon farms. The lice do considerable damage to the farmed fish and there is now growing acceptance that stress induced by increased lice burdens on wild salmonid species linked to fish farm infestations may be contributing to the decline of these wild stocks where farms lie close to migration routes. Within available resources, SEPA has made every effort to support the initiatives of the Tripartite Working Group in attempting to put in place area management agreements providing a mechanism for fish farmers and fisheries interests to work closely together to reduce the spread of sea lice from fish farms.

Medicines have been developed which are capable of controlling sea-lice and reducing their numbers to acceptable levels but there are concerns that these medicines are also capable of damaging other marine organisms if their use is unregulated and they are permitted to exceed safe environmental concentrations. Effective sea louse treatment is nevertheless seen to be fundamental for the continuing success of salmon farming and the success of the Tripartite Working Group initiative relies on effective lice treatments being readily available to the fish farming industry. Recent Norwegian research appears to indicate that control over the level of lice infestation necessary to protect wild fish stocks far exceeds that required by farm operators purely on economic grounds and the actions required to achieve these very low levels requires additional co-operation and investment by the industry in carrying out more effective lice counts and treatments. This initiative is seen by some to be a major step forward in ensuring the survival of the west highland wild sea-trout and salmon stocks and SEPA will co-operate within the limits of its legislative remit to encourage separate fish farm companies operating in the same water body to work together [in co-operation with fishery interests], in such a manner as to permit near-simultaneous treatment of sea-lice within a Lice Treatment Management Area as defined by the Working Group.

A choice of formulations with varying modes of action is also seen as necessary to prevent or reduce the onset of drug-resistance in lice. The strategic control methods now employed in various parts of the world to treat lice at susceptible life-cycle stages have shown benefits in retarding the development of infestations and reducing the need for subsequent repetitive treatments.

As these compounds fall within the scope of the EC Dangerous Substances Directive (as List II substances), EC member states are required to impose site-specific emission standards to meet set environmental quality objectives and safe environmental quality standards [EQS]. In Scotland this requirement is additional to the general assessment carried out by the Veterinary Medicines Directorate when a marketing authorisation for a new product is applied for. SEPA's approach is based

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on the use of predictive models to set limitations on the quantities and rate of release of these compounds to meet the relevant EQS outside a mixing zone (often now referred to as an allowable zone of effects or AZE), based on the hydrographic characteristics of each site.

Until now, SEPA has tended to apply EQSs in isolation with individual effluent components being controlled by separate consent conditions. In the case of biomass a maximum weight of fish stock is specified which should not be exceeded. Limitations on medicines generally relate to the quantity or rate of release, all conditions being governed by the lack of treatment options before discharge. In such a situation one condition is likely to be a limiting factor which should in fact have the effect of limiting the size or scale of the development. Whilst strategic treatments can help reduce lice burdens, infections can develop later when the biomass of fish approaches its consented maximum. Circumstances may have arisen at some sites however where consent conditions restricting the release of chemicals would not permit an effective treatment at peak biomass. Rapid re-infestation may then take place and the position could be exacerbated if other neighbouring farms cannot be treated in such a manner as to eradicate the lice over a wide area. In those circumstances the Tripartite WG objective [that no sexually mature adult lice should be present on farmed stock] is likely to be impossible to achieve and SEPA's actions may in fact jeopardise achievement of this objective due to the limitations placed on the release of chemical therapeutants where these are out of step with the permitted biomass.

Adoption of an approach seeking to match the maximum biomass with the ability to carry out an effective chemical treatment would prevent this situation arising and SEPA will consult interested parties on the need to formalise such an approach by imposition of specific discharge consent conditions.

In addition, there have been allegations that some operators have resorted to chemicals which have not been developed for aquatic use and present a risk of serious environmental damage as the practice is completely untested and unauthorised. Such a matching would also reduce the incentive to resort to such desperate acts.

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## 4. Policy

Against the above background it is incumbent on SEPA to take a broad and forward-looking view rather than treat each new application as if it stood entirely alone and would not be followed by others in adjacent areas. It is therefore considered prudent to apply the same rigorous assessment to expansion of existing farms as to development at a virgin site and the following policy adheres to that principle.

- recognising that the Locational Guidelines for the Authorisation of Marine Fish Farms in Scottish Waters includes an indexing of relative levels of nutrient enhancement as part of the categorisation of waters contained therein, and
- taking account of the guidance from the Scottish Executive to SEPA contained in the United Kingdom Code Of Best Environmental Practice in response to PARCOM Recommendation 94/6 on Best Environmental Practice for the Reduction of Inputs of Potentially Toxic Chemicals From Aquaculture Use, and
- recognising SEPA's responsibility to take action to improve controlled waters identified as non-class A, according to SEPA's coastal waters classification scheme.

### **SEPA will adopt the following approach when considering applications for discharge consent to expand existing fish farm sites or to establish new sites:**

1. For areas where there is a high risk of nutrient enhancement [identified as category 1 in Locational Guidance] there should be a presumption against granting consent for new sites or for holding increased biomass, expansion will only be acceptable in exceptional circumstances.
2. For areas where there is a medium risk of nutrient enhancement, [identified as category 2] prospects for new development are likely to be limited, and the establishment of new sites or the expansion of existing sites should be balanced by the achievement of environmental benefits within the same water body, for example linked to the closure of other licensed sites in less-favoured locations through negotiation with operators.
3. SEPA will seek to match the limits placed on maximum biomass with the environments capacity to dilute and disperse pollutants. Where tidal waters are downgraded as a result of pollution from fish farms, SEPA will negotiate to achieve effective remedial action, and will review consents where necessary to reduce maximum biomass limits. Revocation of the consent will be considered in cases where the required remedial measures have not been taken or have proved ineffective.

***In line with SEPA's stated enforcement policy, SEPA will continue to take appropriate formal action against fish farm operators found to be exceeding consent limits on maximum biomass or discharge of licensed medicines, or to be discharging unauthorised formulations to treat sea lice or other pathogenic infections.***