Written submission from Marine Concern

Introduction

The Scottish aquaculture industry's credentials have improved greatly during its 40 years of existence, however in order to continue its improvement and in order to overcome the advances versus problems due to its massive, by an order of magnitude in 20 years, expansion it still has to go further; unless this is achieved Scotland has the potential to face problems comparable with the early days of the industry, which is not something that Scotland should be proud off.

Currently the Scottish Parliament and Government appears to be transfixed on the concept that the term 'maximising sustainability' are two words that can comfortably sit together in the same context. The generally accepted understanding of sustainability is one of, - addressing the needs of today's generation without affecting the needs of future generations. In the marine environment our knowledge of ecosystem dynamics is inadequate and as such the Precautionary Principle must be applied when the effects and indeed accumulative effects are unknown or at best poorly understood. This has become even more important with the change in requirements for pollution 'foot-print', and pollutants released into the water column, more so when combined with the prolific expansion of an industry with little to no facility to assess accumulation or even magnification of unwanted by-products.

It is unfortunate that in nearly three years of the Marine (Scotland) Act 2010, the concept of 'real' and 'effective' spatial planning has not filtered down to those responsible. Currently it appears that those with planning powers know little or pay scant regard to the marine environment, especially to the longer term. It appears that the push for salmon farming will go ahead regardless of its surroundings and indeed other industries such as fishing and tourism. The Marine Act covers the management of seals, which generally results in the shooting of the seals. Whereas with proper spatial planning and the use of fully encompassing double skinned anti predator nets of a mesh size so as not to entrap other wildlife would effectively render shooting obsolete. Increasingly we are fed the term 'last resort', with reference to shooting whereas in effect without the use of true double net structures as mentioned above it is in fact a matter of 'first resort'.

Currently this government and its agencies appears hell-bent on promoting the used of acoustic deterrents, even though they are known to have an adverse effect on cetaceans, they have even been recommended deployment in cetacean hot spots. The scientific research is far from conclusive as to the effectiveness of these acoustic deterrents for seals; much of the evidence is anecdotal from fish farm workers, visual surface accounts. With the exception of high up in a river system there is a dearth of robust evidence. The use of acoustic deterrents is another form of pollution with little benefit either to the industry or the environment. Depending upon the source type, i.e. the intensity from either acoustic deterrent devices (ADDs) or acoustic harassment devices (AHDs), and the local morphology and seabed type; sound propagation can affect an area up to 20 Kilometres from the point source.
Fin Fish Aquaculture

The Aquaculture and Fisheries Bill has the opportunity to address failings in the Marine Act process by including a containment method that would prevent many of the known problems currently seen in the farming of Samonids. Two methods are proposed the first; closed containment (floating and/or onshore), would almost eliminate predation, escapes and pollution (including genetic gene pool of wild salmoids). It could even generate further revenue as a source of fertiliser, therefore off-setting any additional cost.

The second, the fitting of effective, fully encompassing double layer anti predator nets, a relative easy concept with the modern Polar Circle structures, especial when fitted with the well known to the industry, Froyer Ring. In order to avoid further criticism these supplementary nets should be of a mesh size so as not to trap additional wildlife. Such nets would have the ability to contain escapees and reduce other predator attacks such as that from the small percentage of seals that have become 'salmon specialists'.

Both methods might require a slight increase in extra manpower, but as that is being held as one of the industries most important assets that could be a win-win situation.

A reduction in fish stock density is seen as being potentially advantageous for several reasons; better welfare of the fish, reduced disease, and reduced sea lice infestations. All are of benefit to the industry and a secondary benefit to the environment as reduced dosing and treatments could result, with less toxic chemicals being released into the sea.

Shellfish Aquaculture

Generally shellfish farming is held as a less environmentally damaging activity than fin fish farming especially that of salmon production. That said, it has the potential in alter enclosed fiordic loch ecosystems; a matter of loch carrying capacity. Currently most farmed shellfish farming utilises species that filter feed, and most species are very efficient at doing just that. They feed on particulates, and that includes anything small enough to be caught, trapped and/or siphoned. These particulates include species lower down in the trophic levels (food chain) including fish larvae. Industrial scale shellfish farms have the ability to prevent even alter the natural balance in relatively enclosed systems.

Netting used by most mussel farms causes by-catch, as the industry increases so does the death toll to surrounding species. As with the potential to alter contained loch systems by-catch also needs to be addressed.

Poly-Culture

Scotland has a massive resource available to it along its coastal fringe. In Europe Scotland' coastline length is second only to Norway, but even this massive resource can and arguably is being be miss-managed and abused. Polyculture has the ability to offset many issues identified with current methods of intensive fish farming. The introduction of polyculture could also be seen as an opportunity for further
commercial growth, while at the same time in the case of algae production naturally cleaning up an industry that arguably currently holds 'bad neighbour' status.

**Penalties - Fines**

Much of the industry is self-regulated; self-regulation is known Worldwide not to work. Many accounts have been recorded in Scotland both through the Press and Courts of fish farming companies in breach of their guidelines/laws. In the huge Scottish marine area much of this abuse goes unnoticed, unrecorded. Remote, rural and marine locations combined with the Scottish Law requirement of corroboration makes for gaining evidence increasingly more difficult. During these times of austerity the enforcement agencies are increasingly left stranded, leaving an 'open' situation to any industry wanting or capable to exploit it.

In the past puny punishments mean re-offending, poor/no spot checks mean that few are actually caught. Independent, legal enforcement to the industry is a must, with fines large enough to ensure that even the most unscrupulous conform. In this light, powers must be available for instant access to installations, and penalties should include custodial sentences for the people responsible both 'hands-on' employees/contractors and management.

**Conclusion**

Even in the 21st Century we still have limited knowledge concerning the full effects of marine ecosystems. It is these very same ecosystems that provide for our various industries, including fisheries and tourism. Adverse alterations to these ecosystems can affect both our wellbeing and climate; effectively we are meddling in the dark. While these industries remained relatively small scale the adverse effects had also been relatively low-key; this has now altered big time and the effects have the potential to be magnified in specific locations.

Industry self-regulation does not work; independent checks must be compulsory. Much of this abuse goes unnoticed, unrecorded, especially in remote, rural and marine locations. This is a big profitable industry, fines must be set at a scale that make industry officials and stakeholders aware, wary and abide with legislation.

Smaller scale, environmentally friendly, 'real' sustainable (not sustainable for the industry on a short time scale) industry is the only way to go for the longer term. Large scale intensive farming is problematic on many fronts, so much so that in the case of disease the industry has the potential to collapse as has been seen in regions such as Peru. If the Salmonid industry is to prosper then the sourcing of truly sustainable fish feed needs to be addressed, not adversely affecting Global fisheries and potentially causing famine in Third World Countries especially for what is generally seen as a luxury goods/food item.