

Cleaner Fish Position Paper

MCS Position Summary

Sea lice cause one of the major health issues for farmed salmon, the treatment of them is currently dependant on a range of anti-parasitic chemical treatments, both bath and in-feed. The continued reliance and discharge of these chemicals combined with their increasing use and concerns about the build-up of resistance to their efficacy has led the industry to return to looking at the use of cleaner fish for biological control.

Wrasse are at the present the most popular choice as cleaner fish although lumpfish are showing promise in the laboratory. At present their remains a reliance on wild caught wrasse to fulfil the demand for cleaner fish in farmed Atlantic salmon production, although there is an increasing supply of farm-raised fish from hatcheries.

MCS is supportive of the biological control of sea lice and the lessening of dependence on chemical treatments which are discharged directly into the environment. We are however concerned about the use of wild caught wrasse from un-managed, inshore fisheries and the impact their removal could have on local populations. MCS is also concerned about the use of wrasse at the end of the production cycle for salmon and would like to see the wrasse being utilised rather than slaughtered and discarded.

Introduction.

Sea lice are ectoparasitic copepods that cause one of the major health issues for farmed salmon¹. They attach themselves to the epidermis of the fish leading to wounds, poor performance and death if lice are of sufficient numbers². There are two species of sea louse that attach to salmonids - *Caligus elongates* the generalised sea louse that is found on many marine species and *Lepeophtheirus salmonis* which is salmon specific.

There are a number of environmental impacts associated with sea lice infestation, namely the possible transfer of sea lice from farmed fish to wild fish and the release of chemicals used to treat them into the environment³ combined with concern of increasing resistance

¹ Pike, A and Wadsworth, S (2000), Sea lice on salmonids: their biology and control. *Advances in Parasitology*. 44, 233-337

² Wotten, R., Smith, J.W and Needham, E.A (1982). Aspects of the biology of the parasitic copepods *Lepeophtheirus salmonis* and *CALIGUS elongates* on farmed salmonids, and their treatment. *Proc.R. Soc. Edin.* 81B.185 -198.

³³ Costello, M.J. (2006). Ecology fo the sea lice arasitic on the farmed and wild fish. *Trends in Parasitology* 22, 475-483.

Jackson, D., O'Donohoe, P., Kane, F., Kelly, S., Dermott, t (2012). Result of an epidemiological study of sea lice infestation in south Connemara, West of Ireland. *Aquaculture* 364 -365, 118-123.

developing to these chemicals⁴. This concern for increasing resistance combined with the limited array of treatments available and the prevalence of sea lice has led to the need to research innovative methods of sea lice control. The use of cleaner fish as a biological control of sea lice is nothing new, trials took place in the laboratory in the 1980's using a number of wrasse species. Wrasse are natural predators of sea lice and therefore are a logical choice for cleaner or companion fish for farmed Atlantic salmon.

Species.

Wrasse

There are a number of wrasse species used or in trial as cleaner species, both wild caught and farmed.

Corkwing - *Symphodus melops*



Ballan - *Labrus bergylta*



British Marine Life Pictures

⁴ Lees, F., Baillie, M. Gettinby, G. Revie, C (2008). Factors associated with the change of efficacy of emamectin benzoate against infestations of *Lepeophtheirus salmonis* on Scottish salmon farms. J Fish Dis., 31, 947-951

Goldsinny - *Ctenolabrus rupestris*



Marlin

Rock Cook - *Centrolabrus exoletus*



Marlin

Cuckoo - *Labrus mixtus*



Marlin

Lumpfish

Lumpfish are being farmed to also work as cleaner fish.

Cyclopterus lumpus



Wet Web Media

Sources of wrasse

Wild Capture

The use of wrasse as cleaner fish is currently still heavily dependant on wild caught local species. In 2009 and 2010 one salmon farming company in Scotland used over 95% of wild caught wrasse, this company still predominated in wrasse use in 2011 although other large salmon farming companies are now following suit. The ratio of wrasse to salmon is 1:25 or 4%⁵ therefore placing a large burden on wild wrasse populations. If all salmon farms were to rely on wrasse at a 4% ratio this would equate to 1.4 million fish⁶

Wrasse are an un-assessed, inshore species with no specific management measures, quotas or population assessment. It is therefore of concern that the reliance on wild caught wrasse species could have serious implications on wild wrasse population numbers, particularly as some species have high vulnerability and low resilience (table 1) They are pot caught however, therefore the capture method is low impact.

Table 1. Vulnerability and Resilience Scores for Wrasse Species.

Species Common Name	Scientific name	Vulnerability score ⁷	Resilience score ⁶
Corkwing	<i>Symphodus melops</i>	34/100 Medium	Medium k = 0.21
Ballan	<i>Labrus bergylta</i>	67/100 High to Very high	Low k = 0.1
Goldsinny	<i>Ctenolabrus rupestris</i>	33/100 Low to	Medium

⁵ Treasurer, J. Viking Fish Farms LTD. (2013) Use of Wrasse in sea lice control. SARF report 068.

⁶ <http://www.scotland.gov.uk/News/Releases/2012/09/salmonproduction10092012>

⁷ Source Fishbase. www.fishbase.org. Accessed August 2013

		Moderate	k =0.3
Rock Cook	<i>Centrolabrus exoletus</i>	20/100 Low	Medium k= 0.69
Cuckoo	<i>Labrus mixtus</i>	67/100 High to Very High	Low k = 0.16

Farmed cleaner fish

There has recently been a large interest and investment in breeding cleaner fish in hatcheries. In 2013 6,000 Scottish bred Ballan wrasse and 3,000 Goldsinny wrasse were transferred to salmon farms in August and September. This is the result of a £2 million joint research project based at Machrihanish involving industry partners – Scottish Sea Farms and Marine Harvest⁸.

A similar project with Scottish Salmon Company and Meridian Salmon Group was undertaken by Otter Ferry Seafish, was set up in 2012 to farm Ballan wrasse with the objective of deploying more than 250,000 farmed wrasse at the companies sites⁹.

In Shetland a joint project between salmon farming company Hjaltland, Shetland Aquaculture and NAFC Marine Centre is looking at another species – lumpfish (or lumpsucker) as an alternative cleaner fish to wrasse. This fish which is native to Shetland and Norway where the trial fish originate are used in a greater density than wrasse at 10% as opposed to the 4% of wrasse. The advantages they have over wrasse is that they feed all year round (wrasse don't feed in winter) and are less susceptible to the vibrio infection. They are also easier to farm, robust, hardy and are faster growing than wrasse.¹⁰

Issues of Concern.

MCS is supportive of the use of non-chemical solutions to the problem of sea lice management and see the use of wrasse as a good solution. However we have two main concerns:

1)The use of wild caught wrasse from un-managed local fisheries with no mechanism in place to monitor impacts on populations.

As there are no management measures in place to monitor or assess the impact of a fishery on the populations of wrasse there is no way of ascertaining what effect the fishery is having. Due to the vulnerability of some wrasse species, in particular the effective Ballan wrasse there is a real possibility that local populations could be over-exploited. Anecdotal evidence suggests that when used before in the 1990's local wrasse species were fished out to supply the demand for cleaner fish.

⁸ Farmed wrasse to be transferred to Scottish salmon cages. Fishupdate.com. Published online 15th August 2013

⁹ SSC. Meridian team up to fight sea lice. 21st February 2012. Seafood Source.

<http://www.seafoodsource.com/newsarticledetail.aspx?id=14328>

¹⁰ Like it and Lump it. Rob Fletcher. July/August 2013. Fish Farmer. Vol. 36. No 4. Page 8

2) The utilisation of cleaner fish post-harvest.

Cleaner fish are caught or farmed and used for one production cycle, or two under special derogation, however after use they are slaughtered and not utilised post-harvest. MCS believes that this is a waste of fish protein that could be put to use.

MCS Position and Asks

MCS Position:

- MCS is supportive of the use of cleaner fish for the biological control of sea lice as this reduces dependency on chemical based sea lice treatments, which are in themselves at risk of becoming less effective if resistance is built up¹¹
- MCS would like to see the aquaculture industry work towards preferentially using farmed cleaner fish as opposed to both farmed and wild caught.
- Whilst wild caught fish are still being used, MCS would like to see management measures introduced to ensure that the populations of wrasse species are not over-exploited.
- MCS would like to see the aquaculture industry assist with contributing to these fisheries management by supplying catch data, species composition and numbers as required.
- MCS supports the use of wild caught wrasse only if they are sustainably managed or in a Fishery Improvement Project
- MCS believes that cleaner fish should be utilised post-harvest, ideally we would like to see fish re-used in subsequent production cycles provided that the issue of bio-security can be adequately addressed. If however there is a need to harvest cleaner fish at the same time that salmon are harvested then MCS would like to see these fish either going for human consumption or used for fishmeal production.
- MCS would only support the promotion of a human consumption market for cleaner fish species if the species were either farmed or from a managed fishery that did not deplete local populations, as we are concerned about creating a market for an un-managed wild species.

MCS Asks:

MCS is asking **Marine Scotland** to establish a management framework for wrasse species that includes effective monitoring, enforcement and a Harvest Control Rule in order to ensure that the fishery develops in a precautionary manner as wrasse is both a vulnerable and data deficient keystone species.

MCS is asking the **aquaculture industry** to provide data as required to assist in the establishment of a viable fisheries dataset for these species in order to inform the fishery management

¹¹Grant, AN. Medicines for sea lice. Pest Management Science. 2002. Jun; 58 (6): 521-7

MCS is asking the **aquaculture industry** to preferentially use farmed cleaner fish as opposed to wild caught until such a time as wild caught wrasse are sustainably managed..

MCS is asking the **aquaculture industry** to explore markets for cleaner fish post-harvest.