Dr. Guy E. Melville
47 Water Street
Box 26, Freeport NS
B0V 1B0

25 November 2011

Open letter re St. Mary's Bay salmon aquaculture
see also Supreme Court of Nova Scotia File Hfx. No. 352001

Over the last year and a half I have been asked to comment on several aspects of the Transport Canada CEAA environmental assessment Screening (CEAR No. 10-01-55946) pertaining to the installation of two salmonid aquaculture mega-sites in St. Mary's Bay, southwest Nova Scotia. The Screening was a required step in the process leading to the provincial decision to authorize this project. A current court case concerns the attempt by the appellants, the Saint Mary's Bay Coastal Alliance Society and others, to force the respondents, the Minister of Fisheries and Aquaculture and Kelly Cove Salmon Ltd. – owned by Cooke Aquaculture of New Brunswick – to halt the project. My comments on six aspects are presented here, in the order in which they have been raised in recent discussions, for comparative purposes.

Recipients of this letter are welcome to make use of my comments, providing that any use, either in whole or in part, cites the comments in an acceptable scientific manner. Recipients should also be aware that use of the comments does not in any way prejudice the court case. This letter 'follows the rules' of the Supreme Court of Nova Scotia, whereby documents such as affidavits filed with the Court become available to the public unless placed under a specific ban.

Correct citation:
Guy Melville, pers.comm. (personal communication), 2011.

Since written, foot or end note:
Marine Ecosystem Scientist
47 Water Street
Box 26, Freeport NS
B0V 1B0

The six aspects:

(a) Transport Canada approved a highly deficient CEAA screening, which shortchanged most of the major areas of actual concern. These areas of concern included: baseline information and data, e.g. for lobster and Atlantic salmon, meaningful data re nutrient loading, direct effects, far field effects, cumulative effects, therapeutant effects, protected area considerations, meaningful environmental monitoring and, especially (mental) health and socio-economic conditions. The Department of Fisheries and Oceans, DFO, states explicitly that,

under CEAA, every screening of a finfish aquaculture project shall include a consideration of environmental effects, specifically defined to include any effect on health and socio-economic conditions (section 1.8, http://www.dfo-mpo.gc.ca/aquaculture/ref/AAPceaafin-eng.htm). Transport Canada expressly denied the public this right in all their pre assessment materials.

The general quality of scientific effort, reporting and bureaucrat decision-making from government institutions varied from poor to fair in the screening, These deficiencies compounded the inadequacies inherent in assessments at the screening level. Given the scope and depth of the effects of salmonid net-pen aquaculture, former Canadian Minister of Fisheries and Oceans, Robert Thibault, has publicly stated (pers. comm. 2011) that salmonid aquaculture in St. Mary's Bay needs a joint federal-provincial review panel, the highest level of CEAA environmental assessment.

(b) DFO overlooked the eventual near-term lobster habitat disruption from the aquaculture sites, a conclusion based on available scientific information, including science generated by DFO. Lobsters move through the sites and vicinity seasonally, part of the core of the highly productive world-class Lobster Fishing Area 34. Reproductive adults move up St. Mary's Bay from late winter through late spring and back down later in the year, after spawning. Larvae and later stages move back down the bay in the summer and fall. The basis for the near-field dispersal and role of problematic substances with respect to lobster movements and individual sites are covered under (c) and (e) below respectively. However, multiple proximal sites could interfere with lobster movements on a larger scale by way of patchy waste deposition thus habitat fragmentation (e.g. Hovel, K. and R.A.Wahle. 2010. Abstract. Ecology 91:1993).

(c) Efforts by DFO to determine the deposition zones of organic waste using DEPOMOD were inadequate. No resuspension component was used, which precludes any consideration of downstream mid and far-field effects, particularly at lower depths in the water column. Validation of DEPOMOD is limited at high-dispersive sites according to C. Cromey, the lead scientist in the creation and development of the model, which is the case in St. Mary's Bay. The model provides no information with respect to waste dispersal during onshore winds, particularly at depths higher in the water column, which is the case with the cage sites in St. Mary's Bay. This scenario has additional validation shortcomings since the inshore bathymetry is steep and the sediments very coarse. The inshore areas near the cages are particularly vulnerable, since they have these characteristics and this is where larger lobster hide and larvae would settle.

Looking farther afield, no finite element modeling was done by DFO, which it has done for most of the aquaculture sites in southwest New Brunswick. Based on the finite modeling, we know that wastes from high-dispersive sites there can travel

many tens of kilometers in a few days. The potential for nutrient-overenrichment is high in St. Mary's Bay, and dilution is not the solution.

(d) The aquaculture-related risk to wild salmon is substantial. Escaped farmed salmon have been found in 87% of rivers studied within a 300 km radius of the aquaculture industry since 1984 (Morris, M.R.J. et al. 2008. Can. J. Fish. Aquat. Sci. 65:2807-2826). The average proportion of adult migrants was 9.2%, varying up to 100%. Escape events are episodic and can be massive. Escaped farmed salmon have been angled in the outer St Mary's/Fundy Bay area (e.g. Ralph Clements, pers. comm. 2011). Salmon have also recently been caught in lobster traps (e.g. Sheldon Dixon, pers. comm. 2011). It is highly probable (beyond a reasonable doubt) that thousands of salmon have already escaped, in at least two different events, from the new salmon pens at the Grand Passage site. The necessary and probably sufficient conditions for introgression have been met in the Bay of Fundy.

(e) There is extensive evidence that salmonid net-pen aquaculture has harmed lobster habitat for the 'long-haul' wherever the two coincide. Technical 'gray' literature and much local ecological knowledge attest to the widespread loss of habitat in many aquaculture areas of eastern maritime Canada. Anoxia and loss of prey species resulting from nutrient loading are two of the major causes of lobster habitat loss. Port Mouton, Shelburne Harbour and Westport Harbour in southwest Nova Scotia and waters associated with Grand Manan and Passamaquoddy Bay, New Brunswick, constitute several examples of lobster habitat loss. Catches of lobster and other species have declined proximal to these aquaculture areas, while increasing on grounds father away in many instances. A study by Wiber, M.G. et al. (2011. CURA, Halifax) provides a good recent account of evidence of harmful aquaculture. Catch increases by small-boat fish harvesters in maritime Canada are generally the result of good management practices by the harvesters.

(f) Extensive loss of lobster fishing ground has occurred as a result of salmonid aquaculture, as well as loss of fishing opportunities for species such as herring. The loss is well above the minimal percentage often, mistakenly, quoted, because prime fishing occurs in a small proportion of any general fishing management area. Some of the issues in this regard are presented for waters off Grand Manan and Deer Island, New Brunswick, for example (Walters, B.B. 2007. Can. Geogr. 51:139-159).

In addition to the six areas of discussion, there is a growing body of solid evidence that indicates the harm that salmonid aquaculture activities cause lobsters. For example, if lobsters are found near aquaculture cages they often have discoloured moldy-looking flesh; these lobsters have no market value. Pesticide use has caused

huge lobster kills. Molting occurs before eggs hatch with exposure of ovigerous female lobsters to high doses of emamectin benzoate, Slice®, a sea-lice control agent (Waddy, S.L. 2010. Aquat. Biol. 11:47-52). The same study showed that repeated very-small doses caused premolt induction and death.

I hope that this synopsis is useful to the reader, in gaining a better understanding of the environmental effects of salmonid aquaculture in our marine waters. It is only with this kind of information that individuals can make informed judgements about events which affect their daily lives, and ultimately the social and economic well-being of their communities. These considerations are particularly poignant when citizens have been denied their rights, such as occurred as outlined under aspect (a).

Regards,

Guy E. Melville Ph.D.