

# Sustainable Shellfish



## Recommendations for responsible aquaculture

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### Executive Summary



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### Shellfish aquaculture in British Columbia – background and current policy

Although shellfish aquaculture has been practiced along the B.C. coast for centuries, the last hundred years have seen a dramatic increase in the scale and intensity of commercial shellfish operations. Today, over 400 commercial leases are held up and down our coast. As consumer demand for seafood increases, and aquaculture techniques become more technologically advanced, B.C.'s shellfish aquaculture industry is only expected to grow.

This growth is being encouraged by recent changes in provincial policy. In 1998, the B.C. government launched a plan that would double the Crown Land available for shellfish farming by 2008. That policy, along with the changes made to the *Farm Practices Protection* ("Right to Farm") *Act*, make it possible for shellfish farmers to intensify and expand their aquaculture practices even further.

In light of this expansion and in response to complaints about the industry, the B.C. Shellfish Growers Association (BCSGA) developed an Environmental Management System and Code of Practice in 2001. (The BCSGA CoP, while not on their website, is still available via the Association.<sup>1</sup>) The B.C. Ministry of Agriculture, Food and Fisheries (MAFF) adapted this Code of Practice (CoP) and produced its own version in 2002. While the MAFF CoP provided many helpful tips for shellfish farmers, it did not adequately ensure protection against known and

potential environmental impacts. *Sustainable Shellfish: Recommendations for responsible aquaculture* was developed by the David Suzuki Foundation with an eye to augmenting the MAFF CoP in the absence of information about environmental impacts.

In late 2004, MAFF withdrew the CoP from their web page, declared its recommendations redundant, and moved to a system which is now complaint-driven. While there are existing policies and regulations which apply to shellfish aquaculture, the Code of Practice provided guidance for farmers. This guidance from the B.C. government was appropriate given the expanding industry, shifting practices and lack of enforcement of many regulations. In fact, in the absence of the CoP, the industry will use "normal farm practices" as the standard. However, "normal farm practices" for aquaculture have not and, according to agency representatives, will not be defined.

## Shellfish aquaculture in B.C. – what are the issues?

Traditionally, the reported environmental effects of commercial shellfish production have been minimal – shellfish aquaculture requires clean water, does not use introduced food or chemicals, and produces little waste, all of which mitigate some potential impacts on the marine environment.

However, as the shellfish industry intensifies, there is cause for concern. Questions are being raised as to the health of our marine ecosystems,



while our knowledge of those ecosystems is limited and incomplete. Potential negative effects of shellfish aquaculture and other marine industries must be acknowledged and the precautionary principle (the concept of minimizing impacts by proceeding with caution in the absence of knowledge) must be applied.

Potential negative impacts of shellfish aquaculture include:

- alteration of marine bird nesting, feeding and migrating habitats,
- disruption of intertidal water and substrate movement,
- depletion of microorganisms in the water column,
- decreased biodiversity brought about by cultivating single species,<sup>2</sup>
- introduction of non-native species, and

- unknown cumulative effect of all these potential impacts.

The B.C. government is currently developing (or has developed) shellfish aquaculture plans for those areas where the most intense aquaculture is occurring.<sup>3</sup> These plans are intended to both assess those areas and determine the appropriate degree of industry expansion. The plans identify potential new farming sites and provide management direction for shellfish aquaculture in the plan area. The plans specifically state that they are intended to address resource-use conflict and provide the basis for environmentally sustainable aquaculture development.

There are, however, many shortfalls in these plans, including significant science gaps and insufficient public consultation. *Sustainable Shellfish: Recommendations for responsible aquaculture* outlines and analyzes the potential impacts of shellfish aquaculture on the B.C. coast and proposes solutions for a sustainable aquaculture industry with minimal impacts on the marine environment and maximum benefits for B.C. coastal communities.

## Towards a sustainable shellfish aquaculture industry – 9 key recommendations

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**Issue:** Potential impacts of anti-predator netting on wildlife, including birds, are not sufficiently addressed in current plans.

*There are many unanswered questions regarding impacts of anti-predator netting on wildlife. Yet the B.C. coastal plans for shellfish aquaculture currently recommend that netting can be used unless there are studies proving that it is harmful. There are studies of potential impacts currently underway. This practice of proceeding until there is proof of damage is in direct opposition to the "precautionary approach" required under the Oceans Act.*



**1**

**Recommendation 1:** To comply with the Oceans Act, anti-predator netting should not be permitted unless ongoing studies show little to no negative impacts.

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**Issue:** Estimates of "carrying capacity" of a potential tenure do not take local communities of organisms and their nutritional requirements into account. They are merely designed to estimate maximum production.

*"Carrying capacity" refers to the maximum number of organisms that can be sustained in a habitat over the long term. There are serious flaws in the current estimations of the carrying capacity of potential shellfish aquaculture sites. Shellfish eat phytoplankton. So do many other organisms – in fact, plankton is the basic building block of the entire marine food chain. Existing studies focus on the maximum number of shellfish that can be grown, but not their impact on all of the other organisms which rely directly and indirectly on phytoplankton for food.*



**2 Recommendation 2:** Studies on the impacts of phytoplankton depletion on marine ecosystems must be undertaken before this industry is allowed to expand.

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**Issue:** Introduction of alien shellfish species into the coastal waters of B.C. continues to be not only allowed, but encouraged.



*The introduction of non-native, or alien species has been named the second greatest threat to global biodiversity after habitat loss. Yet most farmed shellfish in B.C. are alien species. Although some of these species have been present for decades, others such as the varnish clam were unintentionally introduced as recently as the late 1980's, and others such as the*

*Mediterranean blue mussel are being actively promoted for aquaculture. The "precautionary principle" must be applied to alien species – even if the probability of rampant invasion is low, the risks are unacceptably high.*

**3 Recommendation 3:** No new alien species should be deliberately introduced to B.C.'s coast for commercial exploitation.

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**Issue:** High cadmium levels have been demonstrated in B.C. oysters.

*Cadmium levels are unusually high in B.C. oysters from some areas. Recently, B.C. and Washington state oysters have been refused by some importing countries due to high levels of cadmium which exceeded import guidelines. While studies are underway to determine the cause and source of cadmium in B.C.'s oysters, there is to date a lack of adequate scientific information about this issue and related health concerns. Cadmium (specifically in oysters and scallops) is a serious consideration to be made in discussing the expansion of B.C.'s shellfish industry.*

**4 Recommendation 4:** Cadmium testing and research should continue before allowing further expansion of oyster farms, and precautions should be taken to ensure that new farms are not sited in areas with high cadmium levels in wild oysters.

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**Issue:** Current language in shellfish aquaculture plans allows Fisheries Act violations.

*Coastal plans for shellfish aquaculture currently allow for "avoiding" various Fisheries Act violations, including conditional approval of such habitat threats as channelization of streams. A random visit to a farmed beach revealed extensive anti-predator netting and vexar fencing adjacent to the mouth of a salmon-bearing stream. These are clearly in violation of the Fisheries Act.*

**5 Recommendation 5:** Fisheries Act violations should not be "avoided" - they must be prevented altogether.



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**Issue:** Existing regulations are not enforced.

*There are numerous examples of shellfish farms which contravene legal requirements, including siting, size and intensity regulations. A recent legal decision determined that the approval for expansion of a particular site was a 'sure thing' – therefore, expanding before the approval was granted was allowable. This is in clear conflict with the original intent and purpose of siting regulations and makes a mockery of those regulations.*

**6 Recommendation 6:** Before any further expansion is allowed, agencies must demonstrate both the ability and the will to enforce existing regulations. Farmers who knowingly and/or repeatedly contravene regulations should have their licenses suspended or revoked.

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**Issue:** Location of farms is currently based on water cleanliness and production potential, with little consideration for biological sensitivity of potential sites.

*Sites are currently chosen based on their capacity to produce commercial products. There are now some additional efforts being made to acknowledge the impacts of shellfish farming on nearby residents and tourism operators. What is not being adequately studied or considered is the biological sensitivity of potential sites.*

**7 Recommendation 7:** Farms should only be located in areas where there is a low risk of environmental impacts and where there is low ecosystem sensitivity. Confirmation of these characteristics must be based on third-party scientific assessment.

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**Issue:** Scientific studies on the impacts of the shellfish aquaculture industry are not completed and many have not been undertaken. Cumulative effects of the shellfish aquaculture industry are unknown.

*In areas of very dense farming, such as Baynes Sound, there are certainly significant cumulative effects of the industry. Management plans encourage industry expansion while stating that the agencies are still discussing ways to conduct a comprehensive review of combined impacts of all of the tenure applicants in one area. This renders the studies redundant. In addition, existing studies have only been instigated at the request of local residents.*

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**Recommendation 8:** Expansion should not proceed until all studies, including cumulative effect studies, have been completed. Relevant agencies must fulfill their mandates and take the initiative on appropriate studies and research.

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**Issue:** The health of B.C.'s marine environment is currently not a high priority in the shellfish aquaculture planning process. The focus is on maximum shellfish production.

*Although the language of environmental sustainability is used in coastal shellfish aquaculture plans, the reality is that the plans are all about maximizing product, not minimizing impacts. Those impacts are not well understood – yet continued expansion is not only allowed, it is encouraged.*

*The Baynes Sound Coastal Plan for Shellfish Aquaculture, for example, relies heavily on a risk management study commissioned by the Ministry of Sustainable Resource Management in 2002.<sup>4</sup> This study*



*attempts to assess potential risk of various shellfish aquaculture practices. Some, such as anti-predator netting, are predicted to have low to moderate negative effects upon removal of the netting. Further, the plan acknowledges that "uncertainty remains concerning the significance of these potential impacts", and that there are "uncertainties regarding the timing and habitat requirements of beach spawning animals".<sup>5</sup> However, the plan does not recommend regular removal of nets to minimize known and unknown negative effects.*

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**Recommendation 9:** Shellfish aquaculture plans must place a high priority on the health of the surrounding ecosystem and, in the absence of scientific study results, be designed to minimize any known or potential impacts to that ecosystem.

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## Conclusion

Shellfish aquaculture, if conducted responsibly, has the potential to be a low-impact industry which benefits B.C.'s economy and coastal communities without negatively affecting delicate and biologically diverse coastal ecosystems. However, there are several outstanding issues which must be addressed by both farmers and government regulators before the industry continues its unchecked expansion. Comprehensive studies of environmental impacts of shellfish farming, including cumulative impacts, must be done before expansion is allowed, and the results of those studies must be factored into future expansion decisions in a meaningful way. *Sustainable Shellfish: Recommendations for responsible aquaculture* points to some of the known and potential negative effects of shellfish farming on the environment, as well as some of the flaws and gaps in the planning process. It also proposes solutions – for both shellfish farmers and policy makers – on how to develop a sustainable industry and food source for future generations.

<sup>1</sup> [http://www.bcsqa.ca/bcsqa\\_contact.html](http://www.bcsqa.ca/bcsqa_contact.html)

<sup>2</sup> Dyrinda, P.E.J. 2003. *Marine Biodiversity - An Introduction*. Available online at: <http://www.solaster-mb.org/mb>

<sup>3</sup> <http://srmwww.gov.bc.ca/rmd/coastal/index.htm>

<sup>4</sup> Emmett, Brian. March 2002. *Activities and potential environmental effects associated with shellfish aquaculture in Baynes Sound, B.C.*  
[http://srmwww.gov.bc.ca/rmd/coastal/south\\_island/baynes/p.17](http://srmwww.gov.bc.ca/rmd/coastal/south_island/baynes/p.17)

<sup>5</sup> [http://srmwww.gov.bc.ca/rmd/coastal/south\\_island/baynes/p.17](http://srmwww.gov.bc.ca/rmd/coastal/south_island/baynes/p.17)



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