

## Open-Ocean Net-Cage Salmon Farming in BC

*Province must begin to phase out environmentally hazardous aquaculture operations*

### Overview

Open-ocean net-cage salmon farms are a common enterprise in British Columbia. There are over 100 such fish farms in the province, and each farm holds on average over 500 000 fish, usually Atlantic salmon, a fish not endemic to BC waters<sup>1</sup>. Open-ocean aquaculture operations are a source of controversy, as the negative effects on the environment are well documented. These negative environmental effects are multi-faceted. The five main concerns are as follows.

#### Environmental Consequences

Released waste products

Chemical pollution

Spread of disease

Proliferation of parasites

Escaped salmon out-compete wild stocks

#### Waste.

Effluent from the farms flows out of the nets into the ocean and causes pollution of nearby waterways and seabeds.<sup>2</sup>

**Chemical Pollution.** Chemicals used in the containments readily leach out into the ocean, the complete effects of which remain unknown, but are likely doing damage to local ecosystems.<sup>3</sup>

**Disease.** Open-ocean net-cage farms act as breeding grounds for disease. These diseases can make their way into the surrounding ocean and can affect wild salmon populations.<sup>4</sup>

**Invasives.** Thousand of Atlantic salmon have escaped from open-ocean net-cage fish farms along the BC coast (Farmed and Dangerous). Atlantic salmon are a fierce competitor to local wild populations and lead to decreased numbers of wild, endemic salmon species.<sup>5</sup>

**Parasites.** Like disease, parasites flourish in the crowded pens of salmon. Of notable concern is the sea lice, a parasite that is commonly found in these net-cages. The notorious parasite is difficult to exterminate and can spread to wild juvenile salmon, causing growth problems and often death.<sup>6</sup>



Open-ocean net-cage salmon farms act as breeding grounds for sea lice, which spread to and kill wild juvenile salmon.

### Closed Containment

The primary policy option available to those concerned about the environmental impacts of open-ocean net-cages is to switch to closed system aquaculture (CSA). CSA is defined as:

*“Any system of fish production that creates a controlled interface between the culture (fish) and the natural environment.”<sup>7</sup>*

Although CSA presents technical challenges of its own, it helps mitigate the environmental consequences of open-ocean operations in the following ways:

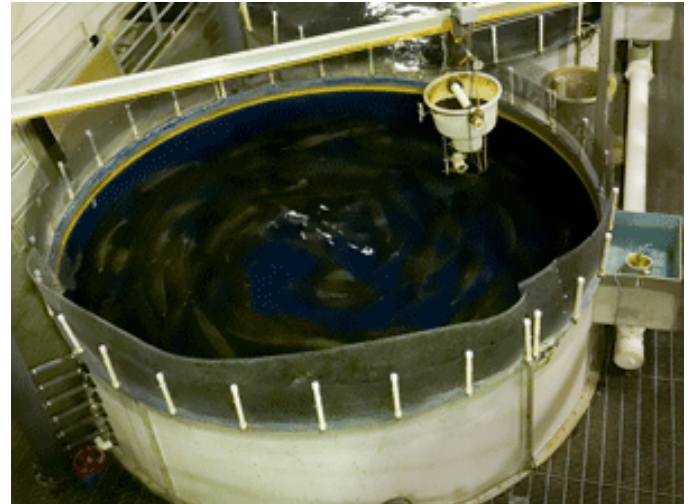
1. Effluent can be carefully directed from the pens, rather than having it continuously flushed into surrounding waters. Contaminated water can be treated and the waste can even be used or sold as fertilizer for agricultural operations.<sup>8</sup>
2. Chemicals used in maintaining fish stocks and cleaning pens can be diverted and carefully disposed of.<sup>9</sup>

3. An impermeable barrier between the aquaculture operation and the ocean will prevent the diseases and parasites from flourishing or from spreading to wild populations.<sup>10</sup>
4. Salmon will be far less likely to escape into the wild in a closed containment system.<sup>11,12</sup>

## Recommendations

Upon careful review of this issue, we advocate that the province of British Columbia begins to phase out open-ocean net-cage salmon farms in preference for closed containment pens. Open-ocean net-cages cause significant environmental problems that are best addressed by transitioning to closed containment pens.

By refusing to switch to closed containment pens, open-ocean salmon farmers are externalizing many of these costs and forcing the ocean to pick up the bill. For the



Fresh Water Institute closed containment pen.

Photo: Andrew S. Wright

stated reasons, we believe a transition to closed containment is the most appropriate course of action and suggest that the BC Government begin this transition immediately.

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<sup>i</sup> **Living Oceans**

<sup>2,7,8,9,10,11</sup> **Global Assessment of Closed System Aquaculture**

<sup>3</sup> **The Environmental Impact of Marine Fish Culture: Towards a Sustainable Future**

<sup>4,6</sup> **Sea Lice Management On Salmon Farms In British Columbia, Canada**

<sup>5,12</sup> **Evidence of Natural Reproduction of Aquaculture-Escaped Atlantic Salmon in a Coastal British Columbia River**



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