

Impacts on the Ocean Floor

While all types of agriculture have some effect on habitat, aquaculture has the lightest effects of any form of large-scale food production. Salmon farms in BC occupy only a tiny proportion of the province's vast near-shore aquatic habitat, and have minimal impacts on the surrounding marine habitat. These effects are limited largely to the ocean floor in the immediate vicinity of salmon farms, but they have been found to be small-scale, short-term, and fully reversible.

What causes impacts on the ocean floor?

Salmon feces and uneaten feed can fall to the bottom under a farm faster than it can be consumed by marine worms, crustacea and other marine fauna. These materials cause temporary oxygen reduction and other chemical changes in ocean-floor sediments as they decompose. These effects are limited to the immediate area of the farm, and the sediments return to normal within no more than several months after a farm is "fallowed" or moved to another site.

How significant are the ocean floor impacts?

Impacts are limited, in part because salmon farms are intentionally sited in deep water over sand and silt bottoms that naturally support low faunal diversity and productivity. Some of the organisms that live in these soft sediments in fact thrive under salmon farms because the wastes are a source of food for them. One study found that the total abundance of bottom-dwelling animals under the edge of salmon farms was significantly more than what would have been naturally found there (Brooks, 2001). It is true that some species are not suited to the enriched conditions under a farm and consequently, there are temporarily fewer types of animals present in the sediments in the immediate area of a farm.

How large an area of the ocean floor is impacted?

The area impacted by salmon farms is quite small. Any effects diminish rapidly as one moves away from the farm pens, and there are no effects once a distance of between 30 and 225 meters from the pens is reached (Burd, 1997; Brooks, 2001). The farm pens themselves usually occupy less than a hectare, so the total area that is temporarily affected by a salmon farm is just a few hectares. Salmon farming accounts for 1/7th of the value BC agricultural production, but all told it affects only 1/20th of 1% of the total area affected by traditional agriculture in the Province. To put that in another way, salmon farming produces over 300 times as much value per hectare impacted as traditional agriculture.

How long do the impacts last?

The impacts of salmon farming are short-lived, in part because nets and other structures that make up the farms are portable. The effects on the ocean bottom begin to naturally reverse as soon as the fish are fully harvested from a site. Within a few weeks to several months, the sediment chemistry returns to normal (Brooks, 2001). The mix of fauna underneath the former farm site will usually return to normal within two to three years, leaving no permanent impacts even immediately under the former farm site.

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What actions are being taken to reduce these impacts?

Ocean floor impacts from salmon farms are being reduced in a number of ways. Most farms have underwater cameras or other equipment that allows them to stop feeding when the fish are full and thereby greatly reduce the amount of waste feed falling to the bottom. Considerable work has also been done to develop feeds that the fish can digest more efficiently, also resulting in less waste generation. Farm siting processes now require environmental assessments to ensure that farms are not located in areas of sensitive habitat.

Is zinc found in the sediments under salmon farms?

Zinc is a trace nutrient that is added to salmon feeds, and some studies in the past detected elevated levels of zinc under the immediate area of farm sites. To avoid this problem, the salmon feed companies have switched to a more digestible form of zinc. A recent study indicated no significant accumulations of zinc under the farm sites using the new zinc supplement (Brooks, 2001).

The BC industry has worked closely with government and researchers to develop performance-based standards that address waste control and ocean-floor impacts. During 2001, intensive research was conducted at six BC salmon farm sites to obtain the data and detailed information that was used in the design of these standards (Brooks, 2001). As the industry grows in BC, salmon farming will continue to leave a very light footprint within the marine environment.
