# Interactions with Other Marine Species

Although they are intentionally located in sites that are relatively little-used by other forms of marine life, inevitably salmon farms do interact with various other species in the waters that surround them – from small invertebrates through to large predators.

## Do farmed salmon eat wild fish and invertebrates?

Salmon are grown in net cages that are open to the ocean environment, and many species of invertebrates and fish float or swim through them. In fact, the nets and other farm structures act like an artificial reef, and many species are attracted to this habitat. Studies have shown, however, that farmed salmon eat very little wild feed, even though they have access to species that are normally part of the diet of wild salmon. This is because farmed salmon are fed as much food as they want to consume in the form of pellets throughout their lives. In one study, only 1% of farmed salmon were found to have any fish in their stomachs, and the small amounts of invertebrates they had consumed were primarily the types growing on the farm nets. The total amount of wild food consumed by a farmed fish was found to be less than 1% of a wild salmon's normal daily intake (Black et al., 1992). Even hungry farmed fish have been found to consume only small volumes of wild feed (Lasic, 1996), making it clear that these fish are not significant competitors for food with wild fish stocks.

## Why do salmon farms use artificial light?

Salmon are very sensitive to the length of daylight, and this is one of the primary cues for them to mature to the spawning stage. Artificial lighting is used at some salmon farms to help prevent a natural phenomenon in which some fish mature early. When early maturation occurs at a salmon farm these fish must be sorted out and removed, causing stress to the fish and lost revenue to the farmer. While lighting may attract wild fish and invertebrates, it has not been found to have negative impacts on other marine life, or to increase the amount of wild food consumed by farmed fish.

## Are birds a problem for salmon farms?

Some birds can be a potential problem for salmon farmers because they attempt to consume juvenile fish, and their feces can be a source of disease pathogens. Birds are prevented from eating juvenile fish simply by putting netting or strings over the top of pens, and the BCSFA Code of Practice specifically forbids any shooting of birds.

## Do seals and sea lions affect salmon farms?

Seals and sea lions are strong predators that occasionally prey on farmed salmon. They are capable of biting fish through nets, and can kill hundreds of salmon in a single night, resulting in significant economic losses. A common method to deter predators is to place a second net, usually heavier and more rigid, around the primary net containing the fish. Salmon farmers can obtain permits from the Department of Fisheries and Oceans to destroy persistent individual predators, under specified conditions and when other deterrence measures have proven insufficient. All culls must be documented and reported to DFO, and they are also monitored by a specific committee of the BCSFA.

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## Are any problem predators endangered?

The primary species of marine mammals that are a problem for salmon farms are the Harbour Seal and the California Sea Lion. The populations of both these species have been rapidly and consistently increasing in British Columbia waters for twenty-five years, and their populations are currently at historical highs (Fraker & Mate, 1999). Stellar sea lions have a stable population in British Columbia, and as Stellars are not usually a problem for salmon farms, only small numbers of Stellars are affected by the licensed cull of problem marine mammals.

## Are acoustic devices used to scare away predators?

Underwater devices called acoustic harassment devices were tested by several companies as a way of keeping predators away from the farms without having to harm them – but their use has been discontinued. The devices operated by simply creating an unpleasant noise that seals and sea lions could hear, but which could not be heard by fish. The Salmon Aquaculture Review recommended that these devices be phased out as they could potentially scare other harmless species such as porpoises. Subsequently, these devices have been removed from use on all BCSFA member farm sites.

Salmon farms have a limited impact on other species in the marine environment. They do not deplete food sources on which wild fish species rely. Predator interactions are one remaining challenge, but this issue is largely resolvable through the use of non-harmful predator nets. Ongoing improvements in farm-site deterrence measures are further reducing the limited need to cull predators, and the ultimate goal is to eliminate all harmful predator interactions.