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# **Seals and Fisheries**

## **A Study of the Conflict and Some Possible Solutions**

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**Abstract.** Interaction between seals and fisheries along the Swedish coast has serious environmental and economic consequences. This thesis describes the conflict as it affects four different small-scale coastal fisheries; the eel fisheries on the west coast, the herring fisheries and salmon fisheries in the northern Baltic and the cod fisheries in the central Baltic. Knowledge gained through studies of the interaction between seals and fisheries has been instrumental for the development of alternative seal-safe fishing gear and mitigation methods. For some fisheries the improved understanding has led to a resolution of certain parts of the conflict.

Certain coastal fisheries in the Baltic, such as the herring gillnet fishery, are at the point of collapse because of this conflict. Damage caused by grey seals to this fishery has been shown to be much more extensive than previously recognised. When seals raid nets, a significant part of the catch is lost without trace. Seals remove fish from nets without leaving any remains. This represents a hidden loss. Another hidden loss is caused by the presence of seals around fishing gear, which scares away fish from the area. The result is often a total loss of catch. Hidden losses are also evident in the gillnet fishery for cod in the central Baltic sea. In recent years damage by seals in the cod gillnet fishery has increased significantly. Due to the high value of cod the cod fishery is currently one of the fisheries that suffer the highest economic loss by seal damage.

Seal-safe fishing gear is at present the only long lasting solution which would meet the needs of both seals and fishermen. Mitigation of damage to catch and fishing gear as well as the prevention of accidental by-catch are two sides of the same problem; a solution to one is also a solution to the other. However, development of new fishing gear is challenging and time-consuming. It requires better knowledge of both fish and seal behaviour. At present suitable alternative fishing gear is not available for the herring fisheries carried out through the whole season. However, a herring trap has been developed as an alternative fishing gear for catching spawning herring in spring time. In the cod gillnet fishery, promising results have been achieved in trials of an alternative fishing gear - the two-chamber pot.

Another coastal fishery in the Baltic subjected to damage by grey seals, is the salmon trap net fishery in the North Baltic. A seal-safe salmon trap has been developed and is used by most of the salmon fishermen. This so called pontoon trap prevents the seal from reaching the catch by keeping the fish in an enclosed seal-safe fish chamber. However, in recent years there have been reports of damage by seals also in the pontoon trap. By filming the seals attacking traps it has been possible to identify 10 individual seals hunting in the traps and to determine that these same animals returned to the traps over a long period of time. It is possible therefore, to limit or decrease damage to the fisheries by limiting access for or by culling the individual seals specialized in raiding fishing gear.

On the west coast of Sweden the eel fyke net fishery suffers from damage by harbour seals. In order to find a lasting solution to the conflict, seal behaviour has been studied as well as the fyke nets' fishing efficiency. The issue of whether it is the eels or the by-caught species which motivate harbour seals to attack fyke nets was studied. It was shown that harbour seals raiding fyke nets have a preference for eel. Certain harbour seals that specialise in foraging at fyke nets, have developed different feeding preferences compared to those of most seals. Seal-safe fyke nets, which resisted attacks while still being efficient in terms of yield, have been developed. They are already in use in commercial fishery along the west coast.