

## Reducing grey seal numbers will not help Baltic fish stocks

For a long time, stocks of herring, sprat and cod have been declining in the Baltic Sea. This is partly a result of long-term overfishing, partly related to human-induced changes, such as eutrophication, oxygen depletion and increased temperatures.

Despite increased numbers over the past 20 years, grey seals have not caused this situation. On the contrary, grey seals have important ecological functions and contribute to biodiversity and stability in the food web. Hence increased hunting pressure of seals would not help the recovery of herring, sprat and cod.

Local problems with weak coastal fish populations are best solved locally, with seal deterrence methods and targeted hunting.

Increased seal hunting in the Baltic Sea has been described by politicians and fishermen as an important tool for restoring not only coastal predatory fish stocks such as pike and salmon, but also pelagic fish stocks. In this context, it is important to distinguish both between the predation of different species of fish and the different species of predators. They have different distributions, population trends and feeding preferences, and they have different sensitivity to environmental changes.

### POLICY RECOMMENDATIONS

**There is no** scientific evidence that increased hunting of grey seals will help the recovery of herring and cod stocks in the Baltic Sea. Overfishing and reduced individual growth, as well as oxygen depletion during spawning in the case of cod, have severely depleted these fish stocks, and environmental factors such as salinity and temperature may negatively affect recovery.

**Seal deterrence** methods and protective hunting around fixed fishing gear, fish farms and in protected areas for fish are more effective than licensed hunting for solving local seal problems. Hunting in the outer archipelagos should be avoided, as it targets also non problematic individuals and may lead to more seals entering coastal waters, where they can cause more problems.

**The hunting quota** for grey seals should be less than 1,900 animals for all Baltic Sea countries combined, so as not to jeopardise the long-term survival of grey seals. Depending on how the seal population develops in the future, this figure will need to be adjusted.





Photo: Hans Christiansson/Moskphotos

Herring is the grey seal's favourite food in the Baltic Sea. Fish stocks are however influenced by multiple factors, primarily fishing, but also by food availability, habitat, competition, and other environmental pressures. Predation by grey seals represents only a minor part of these factors.

This policy brief highlights the current state of knowledge regarding the grey seals' interactions with the commercially fished offshore pelagic species and cod in the Baltic Sea, as well as hunting pressure and the health status of grey seals. Research on the impact of grey seals on coastal fish stocks, such as pike and perch, is ongoing but not covered here.

### Grey seals are opportunists

Based on dietary analyses conducted at the Swedish University of Agricultural Sciences (SLU), grey seals eat many different species of fish, but herring dominates in all age groups. Sprat, whitefish, cod and flounder are also common species on the menu, but the seals' diet varies greatly between different areas of the Baltic Sea. The diet of grey seals and feeding areas also vary between years and seasons depending on food availability.

Grey seals feed opportunistically, preying primarily on locally abundant fish species and typically capturing weaker or more vulnerable individuals. This is a known pattern for predators with a broad menu, known as generalists. This is also why top predators such as seals have an important ecological function and contribute to biodiversity and stability in the food web. For example, when invasive species threaten the structure of the ecosystem, predators such as seals and cormorants can be important, alongside predatory fish, in limiting the damage. Both seals and

### FACTS: GREY SEAL

The **Baltic Sea grey seal** (*Halichoerus grypus*) population declined during the 20th century from over 90,000 individuals to as few as 5,000. This decline was initially driven by bounty-financed hunting in the early 1900s and, later in the 1960s, by poor health and reduced fertility caused by environmental contaminants such as PCBs.

Since **general hunting** was banned in 1974 and several environmental toxins were prohibited in 1978, the population has gradually recovered and was 2025 estimated at between 55,000 and 73,000 individuals in the entire Baltic Sea, all countries combined.

**Most grey seals** are now found along the coast of Stockholm, Södermanland and Östergötland in Sweden, as well as in the Åland Sea and the Finnish Archipelago Sea. The majority of grey seal pups are born in the central and northern Baltic Sea, with only a few recorded in the southern Baltic Sea over the past 20 years.

**Grey seals** are highly mobile and move widely throughout the Baltic Sea, although they appear to have favourite areas to which they return.

cormorants are known to eat the invasive round goby and also the three-spined stickleback in areas where these fishes are common.

### Overfishing is the primary driver of stock declines

Around the same period that the Baltic grey seal population recovered – largely thanks to bans on certain environmental contaminants – increasing concern was raised about the status of commercially exploited offshore fish stocks in the Baltic Sea, such as herring and cod. This may create the impression that grey seals are responsible for the decline in fish stocks. However, both herring and cod stocks began to decline well before the grey seal population increased.

Research shows that, in the case of cod, the collapse of Baltic Sea stocks has been driven primarily by overfishing, oxygen depletion during spawning, and a sharp decline in individual growth. The Baltic Sea's herring and sprat stocks have also been severely affected by overfishing, as well as by reduced individual growth. The changes in fish growth are likely linked to alterations further down the food web, partly resulting from eutrophication and environmental factors such as rising water temperatures and lower salinity. Such factors further impede the recovery of these stocks.

### Limited impact of seals

Although information on seals diet is limited, there are relatively many modelling studies on how seals could affect cod, herring and sprat stocks in the Baltic Sea. These studies however carry considerable uncertainty, given the complexity of marine ecosystems and the dietary flexibility of grey seals. Some studies suggest negative effects, but the majority conclude that the impact is non-existent or very

limited. A few studies even indicate a positive effect of seals on herring and sprat stocks.

Recent results from a sampling programme in the southern Stockholm archipelago challenge the idea that grey seals in the Baltic Sea are hindering herring recovery. The programme, which measures the occurrence of newly hatched herring larvae, indicates some recovery in herring recruitment in 2025 from previously very low levels. This improvement has occurred despite the numerous seals present in the area and is instead likely linked to reduced fishing pressure in the central Baltic Sea and along the coast since around 2020. Historically, large herring stocks have also coexisted with large grey seal populations in the Baltic Sea.

### **Declining health of grey seals**

During the 2000s, the blubber layers of adult male grey seal males have become thinner, with grey seals in Gävleborg county being the leanest. These seals also exhibit a higher incidence of intestinal ulcers compared with seals in other parts of Sweden.

Seal health is influenced by factors such as food availability, which has changed substantially over the past 30 years in terms of quantity, quality, species, and size composition of fish. For instance, the fat content of herring in the Bothnian Sea has declined, reducing the nutritional value of the grey seal diet. As a result, seals must put more effort to meet their daily energy requirement of 3–5 kilograms of fish. Studies at the Swedish Museum of Natural History also indicate that many grey seals carry parasites, such as liver

flukes and hookworms, which cause organ damage and increased mortality.

Data from environmental monitoring show that levels of PCB, DDT, and mercury in grey seals have declined but remain elevated. The seals also have elevated levels of newer environmental toxins, such as PFAS. These toxins have a negative effect on the immune system and make seals more susceptible to disease and parasitic infections.

The Baltic grey seal population is unique, having adapted over a long period to the special conditions that prevail in the Baltic Sea. They breed at a different time of year, can utilize ice floes for breeding and differ in size compared with other grey seals in the world. Recent studies have shown that they have low genetic variation, which probably further compromises their immune systems.

*“Both herring and cod began to decline long before the grey seal population increased. Research show that the decline in fish stocks is primarily due to human activities.”*

Licensed hunting risks scaring hundreds of seals away from their usual resting sites in the outer archipelago, causing them to move closer to the coast, where they can cause problems to fisheries, fish farms and already weakened fish stocks. Localised protective hunting and targeted deterrence measures directed at problem individuals and problem areas are more effective in solving local seal problems. The photo shows grey seals during their moulting period in May, off Hävringe, Sörmland.





Seal populations can decline rapidly due to viral diseases, environmental contaminants, and overfishing, but recovery is slow, as females produce only one pup per year. Here, a female grey seal is nursing her pup, approximately two weeks old, in the outer archipelago of Stockholm, February 2025. An adult male lies in the background.

### Limited hunting pressure in targeted areas

In Sweden, grey seal hunting resumed 2001, first as limited protective hunting to prevent damage to fishing gear and catches, but since 2020 as licensed hunting, without a requirement that hunting must take place in connection with fishing, i.e. also seals on resting sites can be hunted. Grey seals are also hunted in Finland, Åland and, to a much lesser extent, Estonia.

Currently, around 1,500 grey seals are shot annually across the Baltic Sea region. This is close to the estimated number of animals that can be killed without causing a rapid decline in the population – 1,900 animals. The same calculations show that if the current total hunting quota of 2,500 animals per year were reached, the population status of grey seals in the Baltic Sea would deteriorate again, even under the most favourable scenarios for future climate and marine conditions.

Seal populations recover slowly, as seals only give birth to one pup per year, but they can decline rapidly due to viral diseases, environmental toxins and overfishing. Depending on how the seal population develops in the future, hunting quotas will need to be adjusted accordingly.

When Swedish seal management changed from protective to licensed hunting, the so-called specialist strategy was

abandoned, targeting grey seals that specialise in foraging in specific locations. Licensed hunting allows hunters to shoot grey seals where it is easiest to do so – on the haul out areas in the outer archipelago and in seal sanctuaries, during periods when they are not protected. This type of hunting does not target specialist seals. Instead it risks driving more seals away from the outer archipelago and closer to the coast, where they can have a greater impact on fisheries, fish farms and coastal fish stocks. Local protective hunting and deterrence measures at the coast are therefore more appropriate for solving local conflicts with grey seals.

### Key references

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### BRIDGING THE GAP BETWEEN SCIENCE AND POLICY

At the Baltic Sea Centre, scientists, policy analysts and communication experts work together to bridge the gap between science and policy.

We synthesise and analyse scientific research on Baltic Sea issues and communicate it to relevant stakeholders in a timely manner.

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