

Salmon Watch Ireland

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Salmon Watch Ireland Newsletter

The Future of Wild Salmon in Ireland: Aquaculture, Science and the Growing Environmental Debate

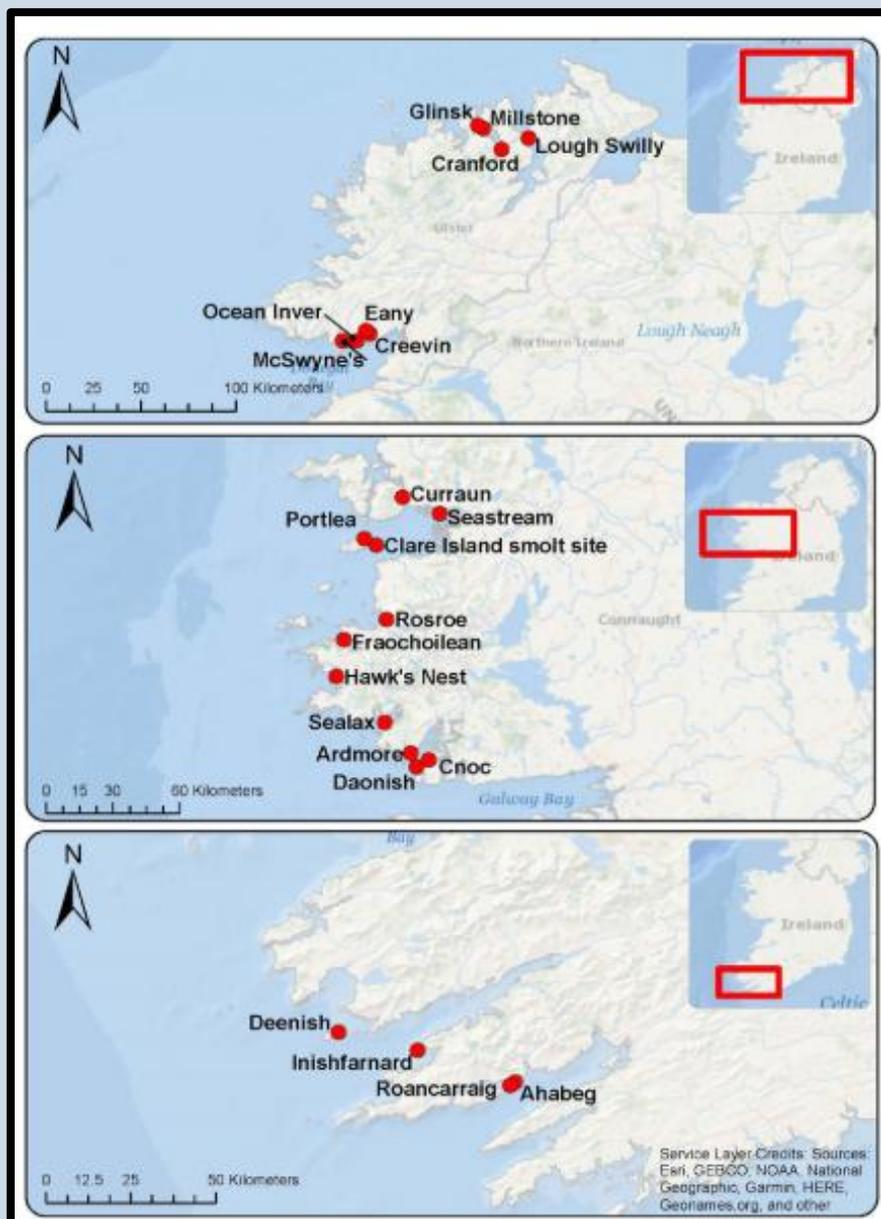


Photo: Marine Institute - Location of Salmon Farms

Introduction

Ireland's wild Atlantic salmon and sea trout are among the most iconic species in our natural heritage. For centuries they have shaped our rivers, coastal communities, and angling traditions. Yet today these remarkable fish face an uncertain future. Across the country, wild salmon populations have declined dramatically over the past several decades, while sea trout runs in many regions have collapsed or become severely reduced.

Many factors contribute to this decline. Climate change, ocean ecosystem shifts, river habitat degradation, and barriers to migration all play a role. But one issue remains central to ongoing debate among scientists, conservation groups and policymakers: the environmental impact of salmon farming in Ireland's coastal waters.

Salmon Watch Ireland continues to raise awareness about this issue because the survival of wild salmon and sea trout may depend on how Ireland chooses to manage aquaculture in the years ahead.

The Rise of Salmon Farming in Ireland

Salmon farming was introduced to Ireland in the 1980s as part of a broader effort to develop aquaculture industries along the Atlantic seaboard. At the time it was seen as a promising economic opportunity for rural coastal communities. Over the following decades the industry expanded, establishing farms in sheltered bays and inlets from West Cork through Kerry, Galway and Mayo to Donegal.

Today Ireland has approximately 38 licensed finfish aquaculture facilities, the majority of which are engaged in the farming of Atlantic salmon. Production levels remain relatively small compared with other major salmon-producing countries, with annual output of approximately 14,000 tonnes of farmed salmon.

It is understood that around 29 of these licences are currently under consideration for renewal as part of the ongoing review of aquaculture licences in compliance with EU environmental legislation. The reduction from the original number of licensed sites may reflect the abandonment of certain licences over time, as well as the amalgamation or consolidation of some farm sites into larger production units.

Nevertheless, the industry is economically significant. Irish farmed salmon is marketed as a premium product and commands relatively high prices in international markets. In recent years the value of Irish salmon production has exceeded €100 million annually.

While this scale is modest by global standards, salmon farms occupy some of the most environmentally sensitive coastal waters in Ireland—areas that also serve as migration routes for wild salmon and sea trout leaving and returning to their rivers.



Open Net Pen Aquaculture

The salmon farming system used in Ireland is known as open net pen aquaculture. Large, mostly circular cages are moored in coastal waters and stocked with thousands of farmed salmon. The cages are made from netting that allows seawater to circulate freely through the pens.

This design provides a constant supply of oxygenated water for the farmed fish and allows waste to disperse into the surrounding environment. However, it also means the farms are directly connected to the marine ecosystem.

Fish farms can therefore interact with wild fish populations in several ways. Waste feed and faecal matter enter surrounding waters. Diseases and parasites may spread between farmed and wild fish. Farmed salmon occasionally escape and can potentially interbreed with wild populations.

For wild salmon and sea trout migrating along Ireland's coastline, these farms represent large concentrations of fish that may alter the natural balance of the marine environment.



Sea Lice and the Aquaculture Debate

Perhaps the most controversial issue associated with salmon farming is the spread of sea lice, naturally occurring marine parasites that attach to salmonid fish.

Sea lice feed on the skin and tissue of salmon and sea trout. In natural conditions in areas without salmon farms, they occur in relatively low numbers. Wild fish normally encounter only small infestations as they migrate through coastal waters.

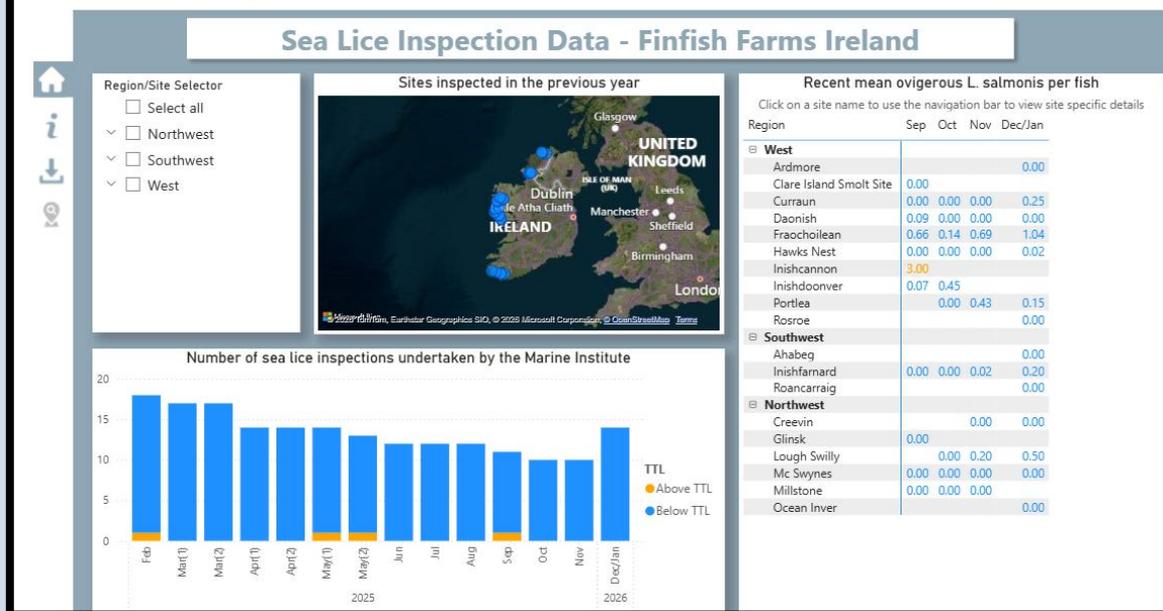
Fish farms, however, can act as large reservoirs for these parasites. A single farm may contain hundreds of thousands of host fish in close proximity, providing ideal conditions for lice populations to multiply.

Adult female sea lice produce large numbers of eggs that hatch into planktonic larvae. These larvae drift in the upper layers of the ocean before developing into infectious stages capable of attaching to passing fish. Ocean currents can transport these larvae considerable distances, potentially spreading parasites throughout coastal regions.

Sea trout are particularly vulnerable because they spend much of their time feeding and foraging in coastal waters. This close association with near-shore areas increases their likelihood of encountering and becoming infested with sea lice.

The following is a portal recently set up by the Marine Institute which replaces monthly reports. This portal is very informative and can be used to check status of farms operating in bays around Ireland.

Sea Lice Inspection Data - Finfish Farms Ireland



Disease Potential to Transfer to Wild Salmonids

Disease associated with intensive salmon farming presents a potential risk to wild salmon and sea trout populations. High stocking densities on farms can facilitate the development and spread of pathogens such as Amoebic Gill Disease (AGD), Cardiomyopathy Syndrome (CMS) and Pancreas Disease (PD). Because these farms operate in open marine environments, pathogens may disperse through surrounding waters and expose wild fish that migrate through or forage near these areas. Sea trout, which often remain in coastal waters close to farms, may be particularly vulnerable. Unlike farmed fish, wild fish cannot be vaccinated or treated against emerging or novel diseases. Despite these concerns, there has been very limited dedicated research in Ireland examining the potential transmission of these diseases from salmon farms to wild salmon and sea trout populations, leaving important questions about the scale of the risk unanswered.

Early Signs of Trouble

Concerns about sea lice impacts emerged relatively soon after salmon farming developed along the west coast of Ireland.

Researchers and fisheries managers began observing unusual patterns among sea trout populations. Large numbers of sea trout were returning prematurely from the sea to freshwater rivers only weeks after migrating as smolts. These fish often showed extensive skin damage caused by heavy infestations of sea lice.

The phenomenon was particularly noticeable in areas where salmon farms were located near river mouths. Both adult sea trout and immature fish known as finnock appeared to be affected.

These early observations prompted further scientific investigation into the relationship between salmon farming and sea lice infestations.



Decades of Scientific Research

Over the past thirty years the issue of sea lice and salmon farming has been studied extensively by universities, government agencies, and independent researchers.

The first major Irish investigation was published in 1992 in the Sea Trout Working Group Report, commissioned by the Department of the Marine. Since then, numerous studies have examined the distribution of sea lice, infection rates in wild fish, and the possible links between aquaculture activity and parasite levels.

Studies have indicated that sea lice originating from salmon farms may significantly reduce the survival rates of migrating salmon smolts and sea trout. Research in the Erriff River system in County Mayo, for example, has demonstrated that high lice levels associated with nearby farms during wild salmon and sea trout smolt migration reduces adult salmon and sea trout returns.

Sea trout populations appear particularly vulnerable because they spend more time feeding in coastal waters close to shore, where aquaculture sites are typically located.

At the same time, some scientists argue that sea lice represent only one of several factors affecting wild salmon survival, and that changes in ocean conditions and food availability may also play major roles.

The result is an ongoing scientific debate that continues to influence fisheries management policy.

Monitoring and Regulation

In Ireland the monitoring of sea lice on salmon farms is carried out by the Marine Institute under a regulatory system known as Monitoring Protocol No. 3 for Offshore Finfish Farms.

Fish on aquaculture sites are inspected regularly throughout the year, with increased monitoring during the spring migration period when wild salmon smolts leave rivers and enter coastal waters.

If lice numbers on farmed fish exceed established thresholds, treatment measures must be applied to reduce infestations.

However, critics have questioned whether current monitoring procedures are sufficient. Sampling typically involves examining around 60 fish per inspection, even though individual farms may contain hundreds of thousands of fish.

Some researchers argue that such small samples may not accurately reflect parasite levels across large aquaculture operations. Others point out that treatment thresholds are based on lice counts per fish rather than the total number of fish present, meaning large farms may produce far more lice larvae than smaller sites even when average counts appear low.

These concerns continue to shape discussions about how aquaculture should be regulated in Ireland.

Ireland in the Global Aquaculture Industry

Globally, salmon farming is dominated by a few large producing countries. Norway alone produces more than 1.4 million tonnes of farmed salmon annually, while Scotland produces over 170,000 tonnes.

By comparison Ireland's production of around 14,000 tonnes represents a very small share of global output.

However, the environmental challenges faced by the industry are not unique to Ireland. Large-scale aquaculture in Norway, Scotland, Canada and Chile has also encountered difficulties linked to disease outbreaks, parasite infestations, and environmental impacts in coastal waters.

In response, some countries have begun exploring new technologies such as closed containment systems designed to separate farmed fish from the surrounding marine environment.

These developments may offer insights into how aquaculture could evolve in the future.

Legal Challenges and Protected Areas

European environmental law has also played an important role in shaping Ireland's aquaculture policy.

In 2007 the European Court of Justice ruled against Ireland for failing to properly assess aquaculture activities within protected Natura 2000 marine sites. These areas, designated under the EU Birds and Habitats Directives, are intended to safeguard important habitats and species.

The ruling highlighted deficiencies in how aquaculture licences were assessed and monitored within Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

Following the European Court of Justice judgment, Ireland introduced legislative measures to address the failures identified in the regulation of aquaculture activities within Natura 2000 protected areas. A key provision was the introduction of Section 19A (4) into aquaculture legislation, which allowed existing aquaculture operations to continue while the State carried out the required Appropriate Assessments under the EU Habitats Directive.

This provision effectively protected existing fish farm licences from expiring while the assessment process was undertaken. The intention was that once the necessary environmental assessments were completed, aquaculture licences could then be renewed in compliance with European environmental law.

Although Appropriate Assessments have since been completed for many of Ireland's marine Natura 2000 sites, no aquaculture licence has yet been formally renewed under this revised regulatory process. As a result, many salmon farming operations continue to function under the transitional arrangements introduced through Section 19A (4), pending the completion of the full licensing review system.

Nevertheless, the presence of salmon farms within ecologically sensitive marine areas continues to attract scrutiny from environmental organisations.

Climate Change and Emerging Pressures

At the same time, broader environmental changes are affecting marine ecosystems around Ireland.

Rising ocean temperatures may influence both salmon and sea lice populations. Warmer water can accelerate the life cycle of parasites, allowing them to reproduce more rapidly. Changing ocean conditions may also alter the distribution of plankton and other food sources that young salmon rely on during their early marine life.

These factors add further complexity to the challenge of managing both wild fisheries and aquaculture operations.

Shared Future for Aquaculture and Wild Fish

Ireland's wild Atlantic salmon and sea trout are part of a fragile ecological system linking rivers, estuaries and the open ocean. Their survival depends on the health of each stage of this migratory journey. Pressures that arise in coastal waters — particularly during the early marine phase — can therefore have profound effects on the number of fish that eventually return to spawn.

Salmon aquaculture is also an established economic activity in a number of coastal communities. However, the current system of open-net salmon farming places large concentrations of farmed fish directly within the marine environment, where parasites, disease and waste can interact with wild fish populations.

For this reason, Salmon Watch Ireland believes that the long-term protection of wild salmon and sea trout requires a fundamental change in how salmon aquaculture is carried out. The only reliable way to eliminate the interaction between farmed and wild fish is to separate production from the marine environment entirely.

Our position is that salmon farming should transition to land-based closed containment systems, where fish are reared in fully controlled facilities on land. Such systems can prevent the release of sea lice and disease into coastal waters, eliminate escapes of farmed salmon, and allow waste and water quality to be properly managed and treated.

Various semi-closed containment systems are currently being explored within the aquaculture industry as a possible improvement on traditional open-net farming. However, these systems remain largely experimental and have yet to demonstrate that they can reliably eliminate interactions between farmed fish and wild salmonid populations. Until such technologies are proven to prevent parasite transmission, disease transfer, and escapes, they cannot be regarded as a definitive solution to the environmental problems associated with open-net salmon farming.

However, even with land-based systems, the sustainability of feed sources remains a significant issue. Modern salmon aquaculture relies heavily on feeds derived from wild-caught marine fish and other protein sources. Ensuring that these feeds are sourced sustainably, without placing additional pressure on global marine ecosystems, will be an important challenge for the future development of the industry.

Moving production onto land would remove the direct ecological interaction between farmed and wild fish in coastal waters. At the same time, the industry must address the broader environmental questions surrounding feed supply if aquaculture is to become genuinely sustainable in the long term.

Protecting an Iconic Species

Atlantic salmon have been part of Ireland's natural heritage for thousands of years. They have shaped ecosystems, supported local economies, and inspired generations of anglers and conservationists.

Today their future is uncertain. Wild salmon populations across the North Atlantic are experiencing widespread decline, and Ireland is no exception.

Addressing this challenge will require cooperation between scientists, policymakers, industry and conservation groups. It will also require open public discussion about how Ireland manages its coastal resources.

Salmon Watch Ireland remains committed to ensuring that the science surrounding salmon farming and wild fish survival is properly understood and considered in future policy decisions.

The choices made today will determine whether wild Atlantic salmon and sea trout continue to thrive in Ireland's rivers—or become a fading memory of a once abundant natural legacy.

If you require specific details on any issues concerning salmon aquaculture in Ireland, you can access detailed information below. In the drop-down menu there a number of separate pages incorporating, Sea Lice, Disease, Sea Lice / Disease Control, New Technologies including closed and semi closed technologies.

The image is a screenshot of the Salmon Watch Ireland website. At the top, the logo reads "SALMON WATCH IRELAND" with the tagline "Dedicated to the restoration of salmon abundance in Ireland". Below the logo is a navigation menu with the following items: "SALMON WATCH IRELAND - IRELAND'S ATLANTIC SALMON", "CONTACT", "POLICIES", "LATEST NEWS", "SALMON FARMING IN IRELAND", "SALMON AND SEA TROUT DATA RESOURCE", "SALMON WATCH IRELAND CONFERENCE", "SWIRL ACCOUNTS", "ADVOCACY FUNDING - SALMON WATCH IRELAND", "DOCUMENT LIBRARY", "DOCUMENT SEARCH", and "BANTRY BAY DECISION: VINDICATION FOR WILD SALMONIDS". The main content area features a banner with the title "Sea Trout Extinction Vortex". The banner includes three images: a landscape with mountains and a lake, a close-up of a sea trout head, and a view of a lake with several circular fish pens. Below the images, the text reads: "Connemara Fisheries Destroyed", "Sustainable Angling Product Destroyed", and "Nature and Biodiversity Destroyed".