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Riaghaltas na h-Alba
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THE VALUE OF AQUACULTURE IN SCOTLAND

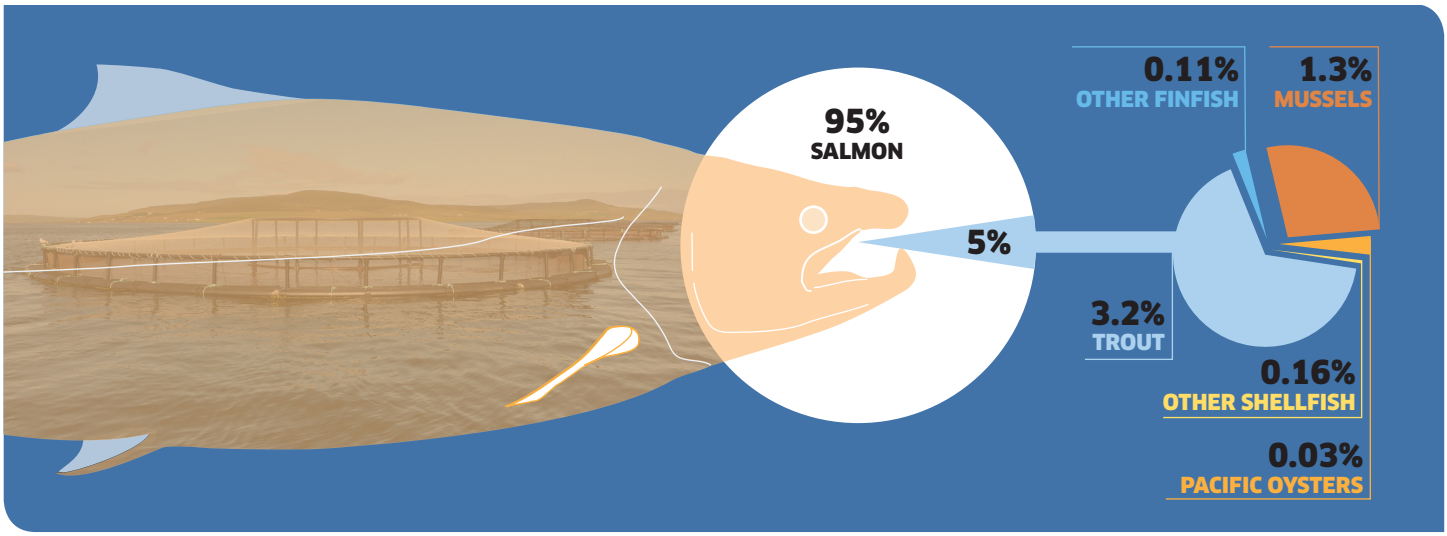

FIGURE 1.
AQUACULTURE SECTORS BY PRODUCTION VALUE (2015)

Introduction

This topic sheet summarises the latest evidence on the economic impact and structure of Scotland's aquaculture industry. It draws on recent research commissioned by Marine Scotland and Highlands and Islands Enterprise (HIE) to update evidence on the baseline economic impact of Scotland's aquaculture supply chain.

Scotland's aquaculture supply chain is composed of farms producing finfish and shellfish, upstream businesses supplying farms with inputs such as feed and equipment, and downstream processing and handling businesses, including the retail and food service sectors.

Aquaculture production is diverse in its sectoral focus, and provides a range of seafood products:

- **Finfish** – salmon, rainbow trout, brown trout and halibut
- **Shellfish** – mussels, Pacific oysters, native oysters, queen scallops and king scallops

There is currently no commercial seaweed farming in Scotland.

In 2015, aquaculture production in Scotland was worth **£670 million** (at farm gate prices). Figure1 (above) shows how this is distributed across key aquaculture products.

Finfish aquaculture

Salmon

Atlantic salmon production dominates the Scottish aquaculture sector by volume and value, accounting for 95% of finfish production by value. Atlantic salmon production can be split into two distinct phases – freshwater smolt (young fish) production followed by seawater production, at which stage the fish is grown to harvest size.

Smolt production

Smolt production in Scotland **increased by 22.7%** between 2005 and 2015, with an associated increase in full-time equivalent (FTE) employment of 12.4%. Smolt production has become concentrated, with a shift towards fewer, larger sites.

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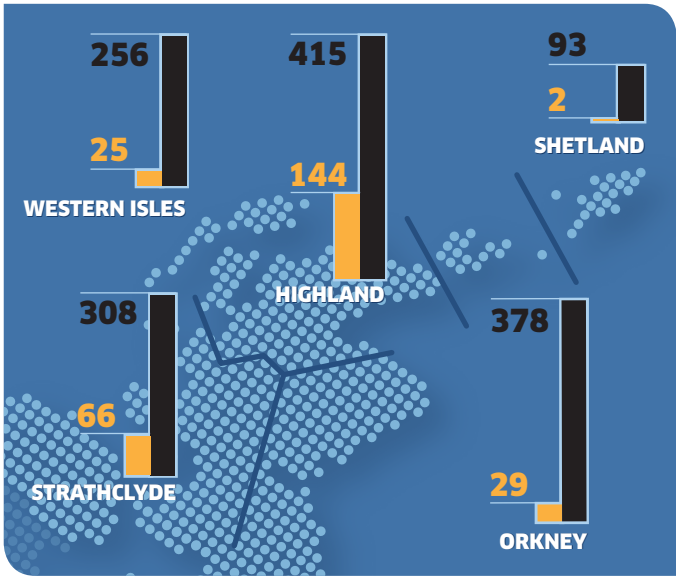

FIGURE 2.
EMPLOYMENT IN SMOLT AND SALMON PRODUCTION BY GEOGRAPHICAL DISTRIBUTION, 2015

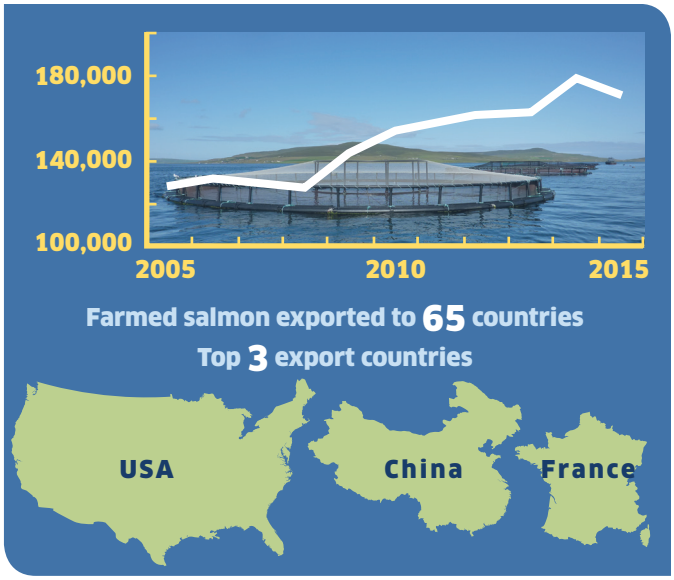

FIGURE 3.
SCOTTISH SALMON PRODUCTION (TONNES), 2006-2016

Salmon production

Between 2005 and 2015, the volume of salmon produced **increased by 32.5%** from **129,588 to 171,722** tonnes. **Employment increased by 43.1%** over the same period **to 1,363**. The structure of salmon production has also shifted towards fewer sites with higher production capacities.

Salmon is produced in inshore sea lochs across the West and North Highlands and the Islands. Ownership of production operations is concentrated among five multinational companies, which between them accounted for **92% of production** in Scotland in 2015.

The value of farmed salmon **exports increased by 150% between 2006 and 2016, to nearly £500 million in 2016.** It is estimated that around 40% of the salmon produced in Scotland is exported from the UK.

Other finfish species

The other main finfish species farmed in Scotland is rainbow trout. In 2015, 8,588 tonnes of rainbow trout were farmed in Scotland - an **increase of 23%** from 2005. Other finfish species currently farmed in Scotland in small volumes are halibut, brown trout and sea trout.

Shellfish aquaculture

Mussel and Pacific oysters are the main shellfish species produced in Scotland. Native oysters, queen scallops and king scallops are farmed in small volumes. There were **144 shellfish businesses** operating in Scotland in 2015. The shellfish sector employed 344 people, of whom 166 worked full time.

The value of Scotland's farmed shellfish (at farm gate prices) was **£10.1m in 2015**, but the sector also extends beyond production to value added processing and marketing. Exports of farmed shellfish are mainly to Europe, although volumes are currently limited.

Mussels

Production of mussels **increased by 72.3%** from 4,219 tonnes in 2006 to 7,270 tonnes in 2015. Shetland accounts for the majority (77%) of Scotland's mussels production.

Pacific oysters

Pacific oyster production has **decreased from 3.1 million shells in 2006 to 2.7 million shells in 2015**. The Strathclyde region accounted for 79% of Scotland's Pacific oyster aquaculture production.

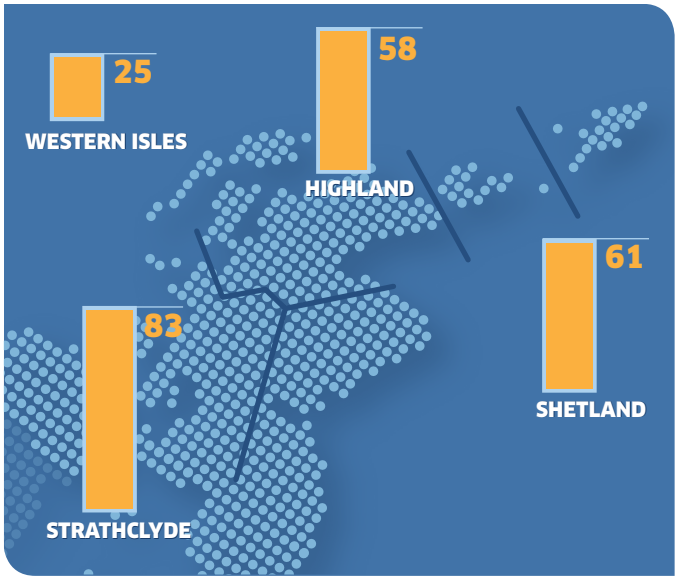

FIGURE 4.
EMPLOYMENT IN SHELLFISH AQUACULTURE BY GEOGRAPHICAL DISTRIBUTION, 2015

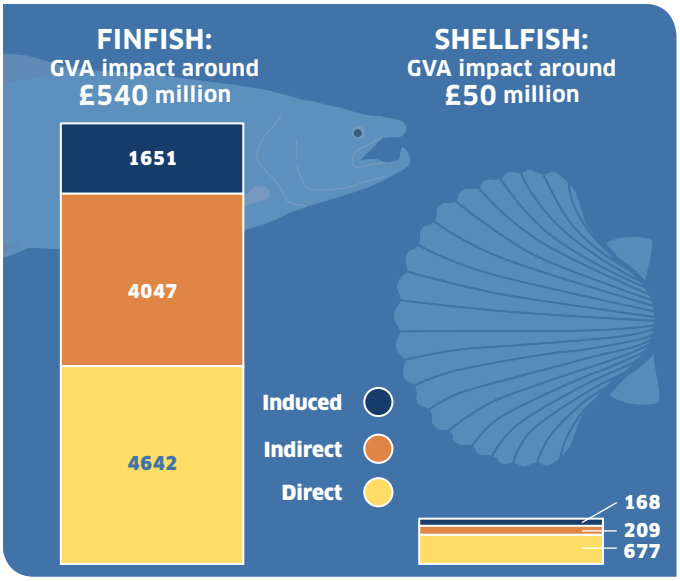

FIGURE 5.
EMPLOYMENT IMPACTS ACROSS THE SALMON AND SHELLFISH AQUACULTURE SUPPLY CHAINS (FTEs)

Wider economic and social impacts

The whole of Scotland's aquaculture supply chain supported **12,022 FTE jobs** and contributed **£620 million** annually in gross value added (GVA) to the economy between 2014 and 2015. Table 1 shows the economy-wide impacts of different sectors making up Scotland's aquaculture supply chain.[1]

TABLE 1.
ECONOMY-WIDE IMPACTS OF SCOTLAND'S AQUACULTURE SECTORS

	Employment (FTE)	Earnings (£M)	GVA (£M)
Salmon	10,340	271.0	540
Rainbow Trout	472	12.3	25
Other Finfish	61	1.7	3.5
Shellfish	1,054	25.9	50
Relevant organisations, research institutes, etc	95	3.1	4.5
Totals	**12,022**	**314**	**620**

[1]The latest estimates cannot be directly compared to the 2014 Imani Development study because of differences in methodology for identifying and estimating the economic impacts from the aquaculture supply chain.

Figure 5 (above) presents estimates of the economy-wide impacts of salmon and shellfish aquaculture supply chains in Scotland, which can be grouped as:

- **Direct** – aquaculture production at the farm level, including management, administration and some primary processing;
- **Indirect** – upstream activities such as feed and veterinary services, and downstream activities such as secondary processing and transport;
- **Induced effects** - wider economic impacts arising from expenditure across the economy by those earning income from direct and indirect economic activities linked to aquaculture production.

Aquaculture also makes significant social contributions to remote rural areas and to island and coastal communities. Production generates highly skilled jobs and contributes towards sustaining local populations and improving demographic structures. Aquaculture businesses are investing in local skills and infrastructure, and other paid and unpaid roles undertaken by those working in the sector and their families contribute towards the economic and community resilience of remote rural areas and small island and coastal communities.

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Future prospects for Scotland's aquaculture industry

In October 2016, the industry published its strategy **Aquaculture Growth to 2030**[2], which sets the industry's vision to 2030 to increase annual finfish production to between 300,000 and 400,000 tonnes and annual mussel production to 21,000. The latest research identified the following opportunities and challenges to the industry's realisation of this vision. It concluded that Scotland's aquaculture sector would need to address the challenges identified before it can achieve its vision for growth to 2030.

Summary of opportunities and challenges for industry's growth

Opportunities

- **Demand:** aquaculture products remain attractive to UK and global consumers
- **Research and development:** the industry is highly committed to advancing technology
- **Skilled Jobs:** the greater part of the aquaculture supply chain is creating skilled and well-paid jobs
- **Industry structure:** salmon production comprise of operations by big multi-national businesses that can readily raise capital for future growth

Challenges

- **Biological challenges:** sea lice, gill diseases and other threats to fish health that affect productivity and reduce returns to investment in the sector
- **Environmental sustainability:** growth of the sector needs to comply with high regulatory and planning standards to protect the marine environment
- **Economic uncertainty:** parts of the industry may struggle to maintain an adequate labour supply and face potential disruptions to trading relationships with key markets when the UK leaves the European Union

[2]http://scottishsalmon.co.uk/wp-content/uploads/2016/10/aquaculture-growth-to-2030.pdf