



Northern Ireland
Assembly

Research and Information Service Research Paper

23 July 2021

Daryl Hughes

Lough Foyle – opportunities and challenges for cross-border marine management

NIAR 176-21

This research paper discusses potential issues regarding the marine management of the cross-border Lough Foyle. It describes its historic background, governance arrangements and wider policy context. It describes the opportunities for fisheries activities, and explains how unregulated activities threaten the marine environment. It considers current risks to Lough Foyle's environment and economy. It discusses the role of the Loughs Agency and explains the calls for stronger governance arrangements.

Paper 54/21

23 July 2021

Research and Information Service briefings are compiled for the benefit of MLAs and their support staff. Authors are available to discuss the contents of these papers with Members and their staff but cannot advise members of the general public. We do, however, welcome written evidence that relates to our papers and this should be sent to the Research and Information Service, Northern Ireland Assembly, Room 139, Parliament Buildings, Belfast BT4 3XX or e-mailed to RLS@niassembly.gov.uk

Key Points

- Lough Foyle is managed by the Loughs Agency, part of the Foyle, Carlingford and Irish Lights Commission (FCILC), reporting to the North South Ministerial Council.
- The FCILC was created by the North/South Cooperation (Implementation Bodies) (Northern Ireland) Order 1999, and RoI's British-Irish Agreement Act of 1999.
- The Foyle and Carlingford Fisheries (NI) Order 2007, and RoI's Foyle and Carlingford Fisheries Act 2007 made the Agency the 'aquaculture licensing authority', to manage and protect Lough Foyle's fisheries.
- However, without a management agreement the Agency lacks powers in practice.
- Agreement between the UK, RoI and The Crown Estate is needed to commence a management agreement.
- The Marine Act (NI) 2013 allows the creation of Marine Conservation Zones. However, ambiguity regarding jurisdictional boundaries complicates designation of Lough Foyle's native oyster beds.
- Both NI and RoI aim to 'sustainably intensify' shellfish aquaculture.
- Bivalve mollusc meat requires 90% fewer greenhouse gas emissions than cattle meat, and therefore offers an opportunity for more sustainable meat production.
- The Agency provides around 50 native oyster harvesting licences each year in Lough Foyle, yielding 100 to 150 tonnes, valued at ~£400,000 in 2018.
- Unlicensed Pacific oyster farming has expanded rapidly in recent years, to over 60,000 trestles by 2018.
- Licensed oyster farming has an estimated potential value of ~£20 million each year.
- Pests, pathogens and invasive non-native species could be unintentionally introduced by unregulated aquaculture activities:
 - *Marteilia* parasites have caused serious mortalities in other European shellfisheries.
 - The parasite *Bonamia ostreae* has devastated many European oyster beds. It was detected in Lough Foyle in 2005 and has caused low levels of mortality.
 - Though not yet recorded in Lough Foyle, Carpet sea squirt (*Didemnum vexillum*) can smother the sea floor, vessels and equipment.
- Irish Sea surface temperatures are projected to increase by 2 to 3°C by 2100.
- Ocean acidification may inhibit the growth and survival of shellfish.
- Pollution by agricultural runoff and untreated wastewater reduce water quality. Lough Foyle is a 'class-B' water, so shellfish must be purified before consumption.
- On 1 January 2021 the EU banned imports of live bivalve molluscs (e.g. oysters and mussels) from UK 'class-B shellfish waters', including Lough Foyle.
- In 2018 the Northern Ireland Affairs Committee recommended the UK and Irish governments urgently conclude a management agreement to enable the Agency to fully implement the Foyle and Carlingford Fisheries Order/Act 2007.
- At Carlingford Lough the centre line is used as a pragmatic jurisdictional boundary.

Executive Summary

Section 1 of this paper describes Lough Foyle's geography, history and governance arrangements. Lough Foyle is a large shallow sea lough on the border between County Derry/Londonderry in Northern Ireland (NI) and County Donegal in the Republic of Ireland (RoI). A rich salmon and oyster fishery, it has been claimed by both the UK and RoI since partition in 1921. In 1952, Stormont and Dublin created the cross-border Foyle Fisheries Commission to tackle salmon poaching. Following the Belfast/Good Friday Agreement, the Loughs Agency was created to comprehensively regulate fisheries. However, the ongoing jurisdictional ambiguity between London and Dublin has prevented the Loughs Agency from discharging its legal functions in practice.

Section 2 outlines the policy context in which Lough Foyle is managed. Brexit has changed the operating and trading regime for fish producers. Brexit may lead to regulatory divergence on fisheries-related issues, although the NI Protocol ensures that NI remains 'dynamically aligned' with many EU regulations for the purposes of moving goods. Both NI and RoI aim to 'sustainably intensify' shellfish production. This could mitigate climate change, since shellfish production emits few greenhouse gases.

Section 3 presents a framework to understand Lough Foyle, linking economic drivers, activities, pressures, environmental state, impacts, and management responses.

Section 4 describes activities and pressures. Native oysters are harvested sustainably under licence from the Loughs Agency. Pacific oyster farming has grown drastically since 2010, yet the Agency is unable to regulate this due to the jurisdictional ambiguity. Blue mussel farming is currently a minor activity in the Lough, but could become more valuable. Commercial and recreational finfishing is licensed by the Agency.

Section 5 describes changes to the environment's state and social impacts. Lough Foyle's health is threatened by parasites and invasive species which may be imported unintentionally, particularly by unregulated activities. These could cause mass mortality of oysters, and millions of pounds of damage annually. Climate change will place the ecosystem under increasing pressure from sea warming, rising, acidification, de-oxygenation, and changes in salinity. Lough Foyle is being littered by waste from unlicensed aquaculture, and polluted by agricultural runoff and untreated wastewater. Faecal contamination means Lough Foyle is a 'class-B' shellfish water, so oysters must be purified prior to human consumption. Finally, poorly managed aquaculture may displace – or endanger – recreational activities, and damage prospects for tourism.

Section 6 outlines possible ways to resolve the jurisdictional ambiguity. Stormont, London and Dublin all wish Lough Foyle to be managed sustainably. The NI Affairs Committee has recommended the UK and Irish governments urgently conclude a management agreement to allow the Agency to effectively regulate aquaculture, as envisaged. Experience at Carlingford Lough suggests that it *may* be possible to reach a pragmatic agreement without fully resolving the maritime boundary dispute.

Contents

- Key Points 1
- Executive Summary 3
- Contents 5
- 1 Background 7
 - 1.1 Location and physical characteristics 7
 - 1.2 History 8
 - 1.3 Current governance arrangements 9
- 2 Policy context 14
 - 2.1 EU exit, trade and regulatory divergence 14
 - 2.2 Biodiversity 17
 - 2.3 Aquaculture strategies 18
 - 2.4 Climate change 19
- 3 Marine system and management aims 20
- 4 Opportunities: activities and pressures 21
 - 4.1 Native flat oyster harvesting 21
 - 4.2 Pacific oyster farming 21
 - 4.3 Blue mussel farming 22
 - 4.4 Other shellfishing 22
 - 4.5 Commercial and recreational finfish fishing 22
 - 4.6 Recreation and tourism opportunities 23
- 5 Risks: environmental state and social impacts 24
 - 5.1 Marine health 24
 - 5.2 Climate change 25
 - 5.3 Litter and pollution 26
 - 5.4 Shellfish product quality 27
 - 5.5 Recreation and tourism 28
- 6 Ways forward: improving regulatory responses 29

1 Background

This section describes Lough Foyle's location, history and governance arrangements.

1.1 Location and physical characteristics

Lough Foyle is a large shallow sea lough measuring 186 km² located between County Derry/Londonderry (NI) and County Donegal's Inishowen peninsula (RoI)¹ (figure 1). Its sand and mud bed is 4 m deep on average, although the western (RoI) side is deeper and contains a dredged navigation channel². It has a low tidal range, and moderate salinity due to freshwater inflows from its 3700 km² catchment area.

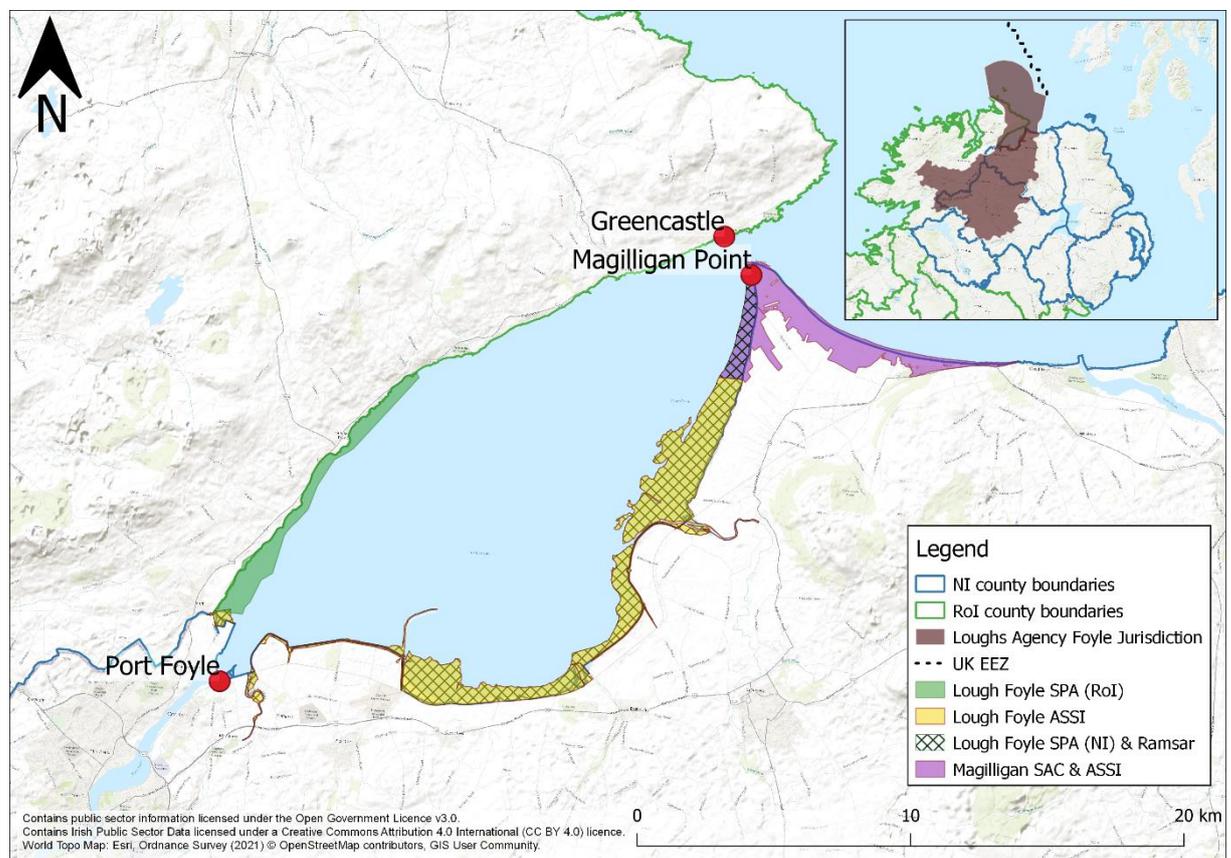


Figure 1 Lough Foyle, Foyle catchment, national and Exclusive Economic Zone boundaries, and key marine conservation designations

¹ [J. Ferreira et al., 'SMILE - sustainable mariculture in northern Irish lough ecosystems: assessment of carrying capacity for environmentally sustainable shellfish culture in Carlingford Lough, Strangford Lough, Belfast Lough, Larne Lough and Lough Foyle', *Institute of Marine Research* \(2007\)](#)

² [R. Macdonald et al. 'The natural history of Lough Foyle, North Ireland', *Proceedings of the Royal Irish Academy, Section B: Biological, Geological, and Chemical Science* \(1953\), 54:67-96](#)

1.2 History

Lough Foyle has been a rich fishery for centuries³. Salmon and eel fishing rights were granted to the Honourable Irish Society in 1613, as part of the plantation of Ulster⁴. The only exceptions were those fishing rights afforded to the Bishop of Londonderry which were subsequently purchased by the Honourable Irish Society in 1704.

The partition of Ireland in 1921 and the establishment of Northern Ireland resulted in confusion and debate around who owned the fishing rights within Lough Foyle⁵. This arose because the Government of Ireland Act 1920 had failed to legislate on territorial waters, as it was assumed that Northern Ireland and Southern Ireland would both remain parts of the UK. However, the creation of the Irish Free State and subsequently the Republic of Ireland broke this link with the UK. The extent of Irish and British territorial waters has been disputed ever since. The resulting ambiguity continues to have an impact on the management of Lough Foyle and its fisheries.

In the 1930s and 1940s the lack of a cross-border regulatory system and the impact of poaching – particularly of salmon – damaged the fisheries⁶. To address this, the Stormont government and Dáil Éireann introduced respective and complementary Foyle Fisheries Acts in 1952^{7,8}. These Acts created the Foyle Fisheries Commission which was staffed by civil servants from both jurisdictions and which had a range of powers to manage, conserve, protect and improve the fisheries in the Foyle area. Under the auspices of the Commission, the two governments purchased the fishing rights in Lough Foyle from the Honourable Irish Society for around £100,000⁹. The Commission managed the fisheries until 1998. It was superseded by the Loughs Agency which is part of the Foyle, Carlingford and Irish Lights Commission (FCILC) which was established following the Good Friday/Belfast Agreement in 1998.

The North/South Cooperation (Implementation Bodies) (Northern Ireland) Order 1999¹⁰ in conjunction with British-Irish Agreement Acts of 1999¹¹ and 2002¹² form the legislative basis for the FCILC and the Loughs Agency. The FCILC is accountable to the all-island North South Ministerial Council (NSMC)¹³. It also reports to its government sponsor departments: the Department of Agriculture, Environment and Rural Affairs (DAERA) in NI, and the Department of the Environment, Climate and Communications (DECC) in RoI¹⁴.

³ [H. Hore, 'Lough Foyle in 1601', *Ulster Journal of Archaeology* \(1857\), 5:139-143](#)

⁴ [T. Healy, *Stolen waters: a page in the conquest of Ulster*, p.176](#)

⁵ [M. Allen, *Lough Foyle – ownership, licensing, and levy issues related to shellfish* \(2010\)](#)

⁶ [E. Britten, 'Ghost Boats and Human Freight: The Social Wellbeing Impacts of the Salmon Ban on Lough Foyle's Fishing Communities', In: J. Urquhart et al. \(eds\) *Social Issues in Sustainable Fisheries Management* \(2014\)](#)

⁷ [Foyle Fisheries Act \(Northern Ireland\) 1952](#)

⁸ [Ireland Foyle Fisheries Act 1952](#)

⁹ [M. Allen, *Lough Foyle – ownership, licensing, and levy issues related to shellfish* \(2010\)](#)

¹⁰ [The North/South Co-operation \(Implementation Bodies\) \(Northern Ireland\) Order 1999](#)

¹¹ [Ireland British-Irish Agreement Act 1999](#)

¹² [Ireland British-Irish Agreement \(Amendment\) Act 2002](#)

¹³ [North South Ministerial Council, *North South Implementation Bodies* \(2021\), retrieved 7 July 2021](#)

¹⁴ [Loughs Agency, *About Us* \(2021\), retrieved 7 July 2021](#)

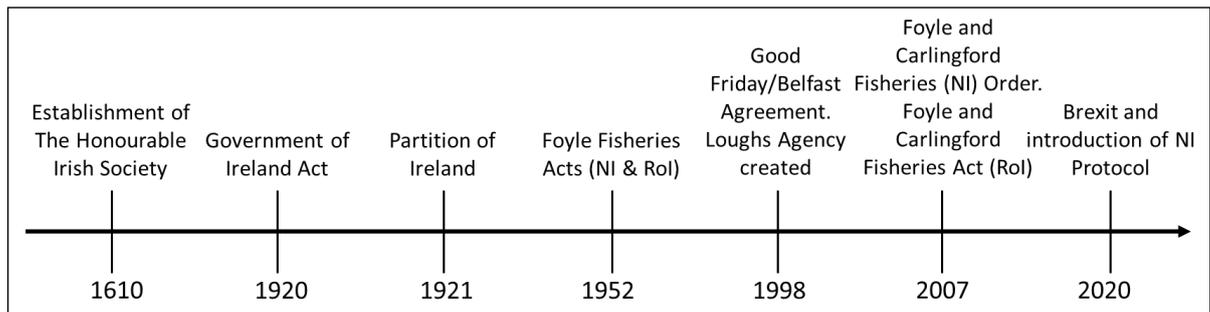


Figure 2 Key events affecting the governance of Lough Foyle fisheries

1.3 Current governance arrangements

The Foyle Fisheries Acts 1952, as amended by the 1999 and 2002 British-Irish Agreement Acts, give the FCILC powers to make regulations ‘*expedient for the management, conservation, protection and improvement of the fisheries of the Foyle Area*’¹⁵¹⁶. In theory, the FCILC is a combined constitution transboundary institution¹⁷, capable of managing Lough Foyle on behalf of the UK and Rol governments. The Foyle and Carlingford Fisheries (Northern Ireland) Order 2007¹⁸ and corresponding Foyle and Carlingford Fisheries Act 2007 (Rol)¹⁹ give the Loughs Agency additional legal functions to manage and protect these fisheries. In particular, these make the Agency the ‘aquaculture licensing authority’.

However, the 2007 Order and Act have been only partially commenced by their respective governments. In NI, most of the Order was brought into force on 1 June 2008²⁰, except parts of Article 3 (Aquaculture). In Rol, most of the Act came into operation on 1 June 2008, except for Sections 4 (Aquaculture), 34 (Amendment of Fisheries (Amendment) Act 1997), 35 (Amendment of Foreshore Act 1933) and Schedule 1 (Provisions of the 1952 Act)²¹²². In both cases, the outstanding provisions relate to the insertion of additional provisions into the 1952 Acts (e.g. Schedule 52A of the NI Act). The following provisions of the 2007 Order are currently prospective²³:

- 52A – Aquaculture licences
- 52D – Form and conditions of aquaculture licences
- 52E – Duration of aquaculture licences

¹⁵ [Section 13, Foyle Fisheries Act \(Northern Ireland\) 1952](#)

¹⁶ [Ireland Foyle Fisheries Act 1952](#)

¹⁷ [W. Flannery et al., 'Evaluating conditions for transboundary Marine Spatial Planning: Challenges and opportunities on the island of Ireland', *Marine Policy* \(2015\), 51:86-95](#)

¹⁸ [Foyle and Carlingford Fisheries \(Northern Ireland\) Order 2007](#)

¹⁹ [Ireland Foyle and Carlingford Fisheries Act 2007](#)

²⁰ [The Foyle and Carlingford Fisheries \(2007 Order\) \(Commencement No. 1\) Order \(Northern Ireland\) 2008](#)

²¹ [Ireland S.I. No. 153/2008 - Foyle and Carlingford Fisheries Act 2007 \(Commencement\) Order 2008](#)

²² [Irish Statute Book, Foyle and Carlingford Fisheries Act 2007: Commencements, Amendments, SIs made under the Act \(July 2021\), retrieved 7 July 2021](#)

²³ [Part VIA of the Foyle Fisheries Act \(Northern Ireland\) 1952](#)

- 52F – Effect of aquaculture licence
- 52I – Revocation of aquaculture licences
- 52J – Surrender of aquaculture licences
- 52K – Vesting of aquaculture licences on death or bankruptcy of holder
- 52L – Transfer, etc. of aquaculture licences
- 52Q – Reasons to be given for decisions
- 52R – Recapture of escaped stock
- 52S – Offences of making false or misleading statements or false entries
- 52T – Inquiries and inspections
- 52V – Transitional provision – existing licences in the Foyle and Carlingford Areas
- 52W – Transitional provision – applications, etc. for certain licences in the Foyle Area and the Carlingford Area

Schedule 52A(4) appears to be a key provision. It states that:

‘An aquaculture licence shall not specify any area—

- (a) which forms either part of the foreshore or part of the bed of the sea or an estuary owned or lawfully occupied by any person, unless the licence is granted to, or with the consent in writing of, the owner or lawful occupier of that part of the foreshore or that part of the bed of the sea or the estuary; or*
- (b) which is within the limits of a several fishery, unless the licence is granted to, or with the consent in writing of, the owner or lawful occupier of that fishery’.*

Since the ownership of the Lough Foyle’s foreshore, seabed and estuary is disputed, this would appear to be a key barrier to commencing these outstanding provisions. **As a result, the Agency has never had the authority to issue aquaculture licences.** In order to fully commence the 2007 Order/Act, a clarification of the jurisdictional ambiguity is needed. For example, an agreement over the national maritime boundary, and/or a management agreement between The Crown Estate (UK) and the Department of Agriculture, Food and the Marine (DAFM) (RoI)²⁴, or some other agreement.

In NI the foreshore and seabed are reserved matters²⁵, and excepted matters where they related to the Crown²⁶. The Crown Estate claims ownership of most of the UK’s foreshore and seabed out to a distance of twelve nautical miles^{27,28}. The RoI’s Department of Foreign Affairs and Trade (DFAT) disputes this claim. The jurisdictional issues are complex and involve multiple institutional stakeholders (table 1).

²⁴ [D. Lawlor, 'Implementation of the Marine Strategy Framework Directive on the island of Ireland: a critical appraisal of policy, law and governance'. Presentation at Environmental and Planning Law Association of Northern Ireland Conference, 26 June 2013](#)

²⁵ [Schedule 3, Northern Ireland Act 1998](#)

²⁶ [Schedule 2, Northern Ireland Act 1998](#)

²⁷ [Northern Ireland Affairs Committee, Oral evidence: Brexit and Northern Ireland: Fisheries, \(HC 2017-19, 878\) p.15](#)

²⁸ [Northern Ireland Affairs Committee, Brexit and Northern Ireland: Fisheries Fourth Report of Session 2017-19, \(HC 2017-19, 878\)](#)

Table 1 Key institutional stakeholders and their interests in the Lough Foyle area. NB Purple – UK and RoI, Blue – UK only, Red – RoI only.

Stakeholder	Jurisdiction	Interest
Loughs Agency/FCILC/NSMC	UK & RoI	Responsible for Lough Foyle fisheries management
Foreign and Commonwealth Office	UK	Claims Lough Foyle as territory
The Crown Estate	UK	Claims Lough Foyle as property
Department of Foreign Affairs and Trade (DFAT)	RoI	Claims Lough Foyle as territory ²⁹
Department of Agriculture, Environment and Rural Affairs (DAERA)	UK	Sponsors Loughs Agency/FCILC Responsible for fisheries-related issues
Department of the Environment, Climate and Communications (DECC)	RoI	Sponsors Loughs Agency/FCILC
Department of Agriculture, Food and the Marine (DAFM)	RoI	Responsible for seafood and aquaculture ³⁰
Food Standards Agency (FSA)	UK	Inspects shellfish food safety
Food Safety Authority Ireland (FSAI)	RoI	Responsible for overseeing food safety
Sea Fisheries Protection Agency (SFPA)	RoI	Responsible for conserving fisheries Licenses and inspects seafood on behalf of FSAI ³¹

Questions:

- **What are the obstacles to creating a management agreement?**
- **How can these be overcome?**

Agreement over the maritime boundary and the signing of a management agreement with the owner/s of Lough Foyle would therefore allow the full implementation of the 2007 Order/Act, and empower the Agency as envisaged by both governments.

Currently, the Agency has extensive legal functions, but little power to discharge these in practice (table 2). The Agency has the power to regulate native oyster harvesting including: licensing, tagging, landing areas and setting catch minimum sizes³². However, the jurisdictional ambiguity undermines the Agency's authority to regulate native oyster harvesting, as some shellfishers believe it doesn't have the required powers^{33,34}. It also regulates finfishing including: selling fishing licences, setting methods and seasons, and prohibiting sales. The Agency introduces regulations each year by 31 January.

²⁹ [OD Deb 13 Feb 2018](#)

³⁰ [Department of Agriculture, Food and the Marine, *Policy: Marine* \(Nov 2020\), retrieved 7 July 2021](#)

³¹ [Food Safety Authority of Ireland and Sea Fisheries Protection Authority, *Service Contract* \(Dec 2019\), retrieved 7 July 2021](#)

³² [Loughs Agency, *Shellfisheries regulations* \(2021\), retrieved 7 July 2021](#)

³³ ['Oyster fishermen being 'demoralised' out of Lough Foyle'. *Donegal Live*, 10 Sept 2020](#)

³⁴ [The Pensive Quill, *The Importance of the Ownership Of The Sea-Bed of Lough Foyle* \(Aug 2020\), retrieved 7 July 2021](#)

Table 2 Roles and responsibilities of Loughs Agency in the Lough Foyle area. NB Light blue – empowered, Medium blue – unable to discharge legal functions: Dark blue – No legal function.

Activity	Legal function	Role in practice
Native oyster harvesting	Issuing of licences	In force, but questioned by some shellfishers
Pacific oyster farming	May grant aquaculture licences ³⁵	None, due to jurisdictional issues
Blue mussel farming	May grant aquaculture licences	None, due to jurisdictional issues
Other shellfish	May not grant aquaculture licences to shellfish other than mussels and oysters ³⁶	None, due to lack of legal function
Commercial and recreational finfishing	Regulation for freshwater fish, salmon and trout, sea bass and tope, eels and elvers on rivers, the shore and the sea.	In force. Issues rod licences, with limits on the size and number of fish caught
Litter	No specific function	None, due to lack of legal function
Pollution	No specific function	Monitors river water quality to facilitate fisheries management ³⁷
Tourism management	Development of marine tourism ³⁸	Produced guides to promote walking, canoeing and boating using INTERREG VIA funding ³⁹

Previous reports have highlighted problems caused by regulatory fragmentation of fisheries and related issues in NI^{40,41}. The cross-border nature of Lough Foyle necessitates some inherent geographical fragmentation i.e. between the areas regulated by FCILC and other inland and marine waters in NI and RoI. There was also substantial institutional fragmentation of inland fisheries-related issues, with responsibilities split across at least six bodies in three departments. However, a major departmental reorganisation in 2016 abolished the Department of Culture, Arts and Leisure (DCAL) which had been responsible for fishing licences, and the Department of the Environment (DoE)⁴². Meanwhile, the Department of Agriculture and Rural Development (DARD) became DAERA and took on a broader remit. DAERA is currently responsible for fisheries-related matters including: angling, water quality, marine protection, pollution, farming, food, agri-environment schemes, planning advice (when this impacts on fisheries), and rural development. This allows more integrated regulations e.g. DAERA sponsors the Loughs Agency and they jointly issue rod licences⁴³. Nonetheless, substantial institutional fragmentation remains between The Crown Estate and DAERA/Loughs Agency. This fragmentation, and the misalignment of institutional aims may contribute to the difficulty in resolving the fisheries management issues. In RoI, fisheries-related issues appear to be fragmented between

³⁵ [UK Foyle and Carlingford Fisheries Order 2007, Part 3](#)

³⁶ [UK Foyle and Carlingford Fisheries Order 2007, Part 4](#)

³⁷ [Loughs Agency, Freshwater Pollution Response Implementation Plan \(2015\), retrieved 7 July 2021](#)

³⁸ [Schedule 1, Annex 1, Part 6, The North/South Co-operation \(Implementation Bodies\) \(Northern Ireland\) Order 1999](#)

³⁹ [Loughs Agency, Marine Tourism and Angling Development Facilities \(June 2016\), retrieved 7 July 2021](#)

⁴⁰ K. Pelan, *An overview of the complexity of inland fisheries management in Northern Ireland* (Oct 2001)

⁴¹ RalSe, *An overview of issues affecting inland fisheries management in Northern Ireland* (Sept 2012)

⁴² [The Departments \(Transfer of Functions\) Order \(Northern Ireland\) 2016](#)

⁴³ [NI Direct, Endorsements to fish both DAERA and Loughs Agency \(2021\), retrieved 7 July 2021](#)

three government departments: DFAT (territorial claims), DECC (sponsors FCILC) and DAFM (aquaculture and seafood) (table 1).

2 Policy context

This section outlines the policy context in which Lough Foyle is managed, including: EU exit, trade and regulatory divergence; biodiversity; aquaculture; and climate change.

2.1 EU exit, trade and regulatory divergence

Brexit has created a new fishing and trading environment for NI's fishing industry. The Fisheries Act 2020 allows NI to regulate sea fishing in its Exclusive Economic Zone (EEZ), and NI fishing vessels anywhere⁴⁴. Previously, under the Common Fisheries Policy, vessels from the UK and other EU member states had access to other states' fishing grounds. Lough Foyle is part of the ICES area VIA⁴⁵. Over an 'adjustment period', running from 1 January 2021 until 30 June 2026, EU boats will give up 25% of their historic annual catch from within UK waters from six to twelve nautical miles^{46,47}. Thereafter, annual talks will decide inter-water fishing quotas. If the UK withdraws EU vessel access to its EEZ, it is possible that the EU may retaliate in kind and also impose tariffs on fish exports. GB fish exporters have faced challenges in exporting products to the EU since the end of the transition agreement in January 2021, due to issues with Export Health Certificates⁴⁸, and an EU import ban on live bivalve molluscs from 'class-B' shellfish waters^{49,50}, which includes Lough Foyle⁵¹. The NI Protocol has preserved NI fishing industry access to its large EU market. This gives NI exporters of fish products to the EU a competitive advantage over GB exporters⁵², but hampers access to GB markets. Future changes in NI trading relationships would almost certainly have an impact on market access for Lough Foyle fisheries products.

A separate issue arose in October 2016, with the unilateral suspension of the Voisinage Agreement, following a RoI Supreme Court ruling⁵³. This informal agreement between Dublin and Belfast in the 1960s allowed NI and RoI fishing vessels under 23 m length to fish up to six nautical miles within each other's territory. This was reinstated in principle by the Sea-Fisheries (Amendment) Act 2019⁵⁴, and in practice by the approval of five RoI ports for landing of catches by NI vessels in February 2021⁵⁵. Customs arrangements at RoI ports apply to both UK and EU vessels with catches

⁴⁴ [UK Fisheries Act 2020](#)

⁴⁵ [EMODnet, Human Activities \(2021\), retrieved 7 July 2021](#)

⁴⁶ ['Eustice denies EU sanctions post-2026 a big issue for fishing industry'. *The Fishing Daily*, 7 March 2021](#)

⁴⁷ [UK Government, EU-UK Trade and Cooperation Agreement \(24 Dec 2020\) p.265](#)

⁴⁸ [DEFRA, Get an export health certificate \(June 2021\), retrieved 7 July 2021](#)

⁴⁹ ['EU trade arrangements will improve for shellfish, UK Fisheries Minister Victoria Prentis vows'. *Seafood Source*, 13 May 2021](#)

⁵⁰ [Centre for Environment, Fisheries and Aquaculture Science, Shellfish classification and microbiological monitoring \(2021\), retrieved 7 July 2021](#)

⁵¹ [UK Food Standards Agency, List of Northern Ireland's classified shellfish beds and their associated harvesting areas \(March 2021\), retrieved 7 July 2021](#)

⁵² [DAERA, Northern Ireland Fishing & Seafood Development Programme Final Report, \(April 2021\)](#)

⁵³ ['Anifpo calls on Irish Government to find landing solution for NI boats'. *The Fishing Daily*, 11 Jan 2021](#)

⁵⁴ [Ireland Sea-Fisheries \(Amendment\) Act 2019](#)

⁵⁵ [Ireland Revenue, Fisheries customs formalities post-Brexit \(Feb 2021\)](#)

from UK waters (as from a third country). NI vessels fishing in RoI waters up to six nautical miles (under Voisinage) must, in addition, provide proof of catch location.

As EU member states, the UK and RoI had equivalent regulatory regimes in many areas⁵⁶. Cross-border areas such as Lough Foyle therefore had substantial regulatory alignment on issues such as environment and agriculture, which could change in future⁵⁷. Regulatory alignment has been maintained through the transposition of previous EU law into UK law, through the European Union (Withdrawal) Act 2018 and European Union (Withdrawal Agreement) Act 2020. The UK's exit from the EU, single market and customs union creates the potential for regulatory divergence between the UK/NI and the EU/RoI⁵⁸. For instance, the UK Government may, over time, amend or repeal retained law. The UK's 25 Year Environment Plan sets the aspiration to 'build on' and 'improve' EU environmental regulation⁵⁹. Conversely, EU law may change. The exit from supra-national bodies may lead to disruption of cooperation mechanisms. The UK left the European Environment Agency on 31 January 2020⁶⁰. However, Sharon McMahon, Designated Officer for Loughs Agency, believes that with a management agreement, the Loughs Agency would be empowered to manage its cross-border jurisdiction effectively, despite anticipated regulatory divergence⁶¹. Key cross-border policy considerations for Lough Foyle are shown in table 3.

Table 3 Lough Foyle cross-border management considerations, governing EU policies, and planned changes to UK legislation

Consideration	EU legislation/policies	Post-Brexit UK legislation
Protected areas - Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)	Habitats Directive Birds Directive	Environment Bill ⁶² - allows the Secretary of State and DAERA to modify water quality regulations pertaining to substances and standards for chemical status.
Protected species - Atlantic Salmon	Common Fisheries Policy	Fisheries Act 2020 - allows NI to regulate sea fishing in Exclusive Economic Zone, and NI fishing vessels anywhere.
Fisheries - Conservation of finfish and shellfish stocks	Common Agricultural Policy	Agriculture Bill ⁶³
Water quality - Diffuse agricultural pollution	Water Framework Directive	- proposes a post-Common Agricultural Policy (CAP) system based on public money for public goods, such as environmental protection, public access to the countryside and measures to reduce flooding.

⁵⁶ [W. Flannery et al., 'Evaluating conditions for transboundary Marine Spatial Planning: Challenges and opportunities on the island of Ireland', *Marine Policy* \(2015\), 51:86-95](#)

⁵⁷ [S. Cave, *What next for the environment, Brexit and cross-border co-operation?* \(May 2019\), retrieved 7 July 2021](#)

⁵⁸ [A. Hough, *Brexit, the Good Friday/Belfast Agreement and the Environment* \(April 2019\), retrieved 7 July 2021](#)

⁵⁹ [UK Government, *A Green Future: Our 25 Year Plan to Improve the Environment* \(2018\)](#)

⁶⁰ [European Environment Agency, *About Eionet* \(Nov 2020\), retrieved 7 July 2021](#)

⁶¹ [Northern Ireland Affairs Committee, *Oral evidence: Brexit and Northern Ireland: Fisheries*, \(HC 2017-19, 878\) p.17](#)

⁶² [Environment Bill - Parliamentary Bills - UK Parliament](#)

⁶³ [Agriculture Bill - Parliamentary Bills - UK Parliament](#)

The potential for regulatory divergence at Lough Foyle is currently somewhat limited by the NI Protocol. This ensures that NI remains 'dynamically aligned' with EU regulations in certain areas in order to avoid border checks on the island of Ireland. These regulations are listed in Annex 2 of the Protocol and include⁶⁴:

- Section 36 – Live animals, germinal products and products of animal origin:
 - Council Directive 2006/88/EC of 24 October 2006⁶⁵.
 - On animal health requirements for aquaculture animals and products e.g. control of risks from non-exotic diseases such as *Marteilia refringens* and *Bonamia ostreae*.
- Section 46 – Fisheries and Agriculture:
 - Council Regulation (EC) No 2406/96 of 26 November 1996⁶⁶.
 - Common marketing standards for fishery products, including edible crab (*Cancer pagurus*) and Norway lobster (*Nephrops norvegicus*).
 - Council Regulation (EC) No 850/98 of 30 March 1998⁶⁷.
 - Protection of juveniles of marine organisms. Covers mostly finfish, crustaceans including *Nephrops* and crabs.
 - Regulation (EU) No 1379/2013 of the European Parliament and of the Council of 11 December 2013⁶⁸.
 - Marketing of fishery and aquaculture products, including finfish, crustaceans and molluscs.
 - Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013⁶⁹.
 - On the Common Fisheries Policy, including measures to promote sustainable aquaculture.
 - Council Regulation (EC) No 1005/2008 of 29 September 2008⁷⁰.
 - Prevention, deterrence and elimination of illegal, unreported and unregulated finfish harvesting.

Finally, it is noted that significant amounts of research funding were previously granted by the EU. For example, the EU INTERREG IVa-funded IBIS project provided €8 million for applied research into sustainable aquatic resources management⁷¹.

⁶⁴ [Foreign and Commonwealth Office. Agreement on the Withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community \(Jan 2020\)](#)

⁶⁵ [OJ L 328/14, 24 Nov 2006](#)

⁶⁶ [OJ L 334, 23 Dec 1996, p. 1.](#)

⁶⁷ [OJ L 125, 27 April 1998, p. 1.](#)

⁶⁸ [OJ L 354, 28 Dec 2013, p.1](#)

⁶⁹ [OJ L 354, 28 Dec 2013, p.1](#)

⁷⁰ [OJ L 286, 29 Oct 2008, p. 1.](#)

⁷¹ [Loughs Agency, INTERREG IVA – IBIS, retrieved 7 July 2021](#)

Questions:

- **If and when UK and EU regulations diverge, what ability will NI have to develop its own regime? And to what extent will it align with GB or RoI/EU?**
- **Does the Loughs Agency currently have sufficient powers and resources to manage potential regulatory divergence?**
- **Is new research funding needed to support sustainable cross-border management?**

2.2 Biodiversity

Lough Foyle is the subject of several biodiversity conservation policies. **The Wildlife (NI) Order 1985** defines the management of protected species⁷². **The Conservation (Natural Habitats, etc.) Regulations (NI) 1995** (enacting the EU Habitats Directive 92/43/EEC) defines protected sites (Special Areas of Conservation and Special Protection Areas)⁷³. **The Environment (NI) Order 2002** defines protections for Areas of Special Scientific Interest (ASSIs)⁷⁴. Since the 1990s, Lough Foyle has received several Marine Protected Area (MPA) designations⁷⁵ (figure 1):

- Lough Foyle SPA (RoI)⁷⁶
- Lough Foyle ASSI (1998)⁷⁷
- Lough Foyle SPA (NI)^{78,79} and Ramsar (wetlands) (1999)⁸⁰
- Magilligan ASSI (1994)⁸¹ and Magilligan SAC (2008)⁸²

The Marine Act (NI) 2013 provides for the creation of Marine Conservation Zones (MCZs) in the NI inshore region to create a network that conserves or improves the UK's marine environment⁸³. MCZs protect nationally important areas of NI's inshore region, protecting them from damage by unauthorised activities⁸⁴. Although a network of MPAs has been created, gaps remain e.g. native oyster beds⁸⁵. A MCZ has already

⁷² [The Wildlife \(Northern Ireland\) Order 1985](#)

⁷³ [The Conservation \(Natural Habitats, etc.\) Regulations \(Northern Ireland\) 1995](#)

⁷⁴ [The Environment \(Northern Ireland\) Order 2002](#)

⁷⁵ [DAERA, MPAs in the Northern Ireland Inshore region \(Nov 2020\), retrieved 7 July 2021](#)

⁷⁶ [Ireland S.I. No. 341/2011 - European Communities \(Conservation of Wild Birds \(Lough Foyle Special Protection Area 004087\)\) Regulations 2011](#)

⁷⁷ [DAERA, Lough Foyle ASSI \(June 2015\), retrieved 7 July 2021](#)

⁷⁸ [DAERA, Lough Foyle SPA \(June 2015\), retrieved 7 July 2021](#)

⁷⁹ [National Parks & Wildlife Service, Site Synopsis: Lough Foyle SPA \(May 2015\)](#)

⁸⁰ [DAERA, Lough Foyle Ramsar \(2021\), retrieved 7 July 2021](#)

⁸¹ [DAERA, Magilligan ASSI, retrieved 7 July 2021](#)

⁸² [Department of the Environment, Magilligan Reasons for Designation as a SAC \(2006\)](#)

⁸³ [Marine Act \(Northern Ireland\) 2013](#)

⁸⁴ [DAERA, Marine Conservation Zones \(2021\), retrieved 7 July 2021](#)

⁸⁵ [DAERA, The creation of a Network of Conservation Sites in the Northern Ireland Inshore Region \(2021\), retrieved 7 July 2021](#)

been created in Carlingford Lough. However, the jurisdictional ambiguity has precluded the creation of MCZs, and the implementation of the Marine Act, in Lough Foyle⁸⁶.

Question:

- **Would designating Lough Foyle's oyster beds protect them from regulated and unregulated activities? Would this give the Loughs Agency more power, in lieu of the full implementation of the 2007 Order/Act?**

2.3 Aquaculture strategies

Both NI and RoI have published strategies relating to aquaculture. NI's strategy for developing the agri-food sector, *Going for Growth*, was launched in 2013. It contained specific targets for the development of fisheries and aquaculture⁸⁷. Recommendations included: Facilitating access to sites for the sustainable development of aquaculture; adding value to seafood by providing access to specialist seafood research and development (R&D) services; and improving water quality to support high quality shellfish production. Progress against these recommendations was last assessed in September 2016⁸⁸. To date there have been no further updates or indications that DAERA is seeking to bring forward a new agri-food strategy.

RoI has had a series of ten-year agri-food strategies. *Food Wise 2025* was launched in 2015 and includes an aim to grow the seafood sector⁸⁹. Actions included: Reviewing the existing aquaculture licensing system, to overcome shortcomings and bottlenecks; developing a strategy to expand aquaculture production within carrying capacity, and; R&D into developing new seafood-based products. The 2019 *Steps to Success* report set out progress against the strategy⁹⁰. RoI is currently developing its next agri-food strategy up the period of 2030⁹¹. The *Draft Agri-Food Strategy 2030* includes: Mitigation of, and adaptation to, climate change; enhancing the environmental sustainability of the seafood sector; and improving competitiveness and productivity producers. Proposed actions include:

- Analysing impacts of climate change on food production.
- Managing inshore non-quota stock to deliver maximum sustainable yield.
- Making aquaculture licences adaptive to technological and environmental changes.
- Encouraging investment in seafood communities to allow for growth and long term economic and social sustainability.

⁸⁶ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Disturbances to Internationally Important Flora and Fauna* \(July 2018\)](#)

⁸⁷ [DAERA, *Going for Growth - A Strategic Action Plan In Support Of the Northern Ireland Agri-Food Industry* \(2013\), pp.63-64](#)

⁸⁸ [DAERA, *Collated update for period ending 30 September 2016* \(Sept 2016\), retrieved 7 July 2021](#)

⁸⁹ [DAFM, *Food Wise 2025 - A 10-year vision for the Irish Agri-food industry* \(2015\), retrieved 7 July 2021](#)

⁹⁰ [DAFM, *Steps to Success* \(2019\), retrieved 7 July 2021](#)

⁹¹ Ireland Agri-Food Strategy Committee, *Draft Agri-Food Strategy 2030 - Draft for Public Consultation* (April 2021)

- Attracting global investment in aquaculture technology.

The 2015 National Strategic Plan for Sustainable Aquaculture Development (NSPA) proposed 24 actions covering growth, innovation, sustainability, spatial planning and licensing⁹². Overall, there is significant overlap between NI and RoI policies to fisheries management, with both governments aiming to sustainably intensify aquaculture.

Question:

- **How could both governments collaborate to promote the sustainable intensification of Lough Foyle's fisheries?**

2.4 Climate change

The UK Climate Change Act 2008 (as amended) commits the UK to a net zero greenhouse gas emissions target by 2050⁹³. The RoI is currently scrutinising a bill that would commit it to carbon neutrality by 2050⁹⁴. The NI Assembly is currently scrutinising two climate change bills: a Private Member's Climate Change Bill (NI) 2021, which proposes more stringent targets than the UK overall⁹⁵, and an Executive Bill. The UK Climate Change Committee highlights that reducing NI's emissions is particularly challenging given its sizeable agriculture sector and the difficulty of reducing biogenic methane from ruminant farming⁹⁶. Some reduction of meat and dairy production may therefore be required. Aquaculture generally emits fewer greenhouse gases than terrestrial agriculture. Bivalve (oyster and mussel) production has a particularly small footprint since it requires no food imports and little on-farm energy use. Bivalve meat typically requires 90% fewer greenhouse gas emissions than cattle meat (less than 4 kg CO₂ equivalent per kg carcass weight, while cattle require over 40 kg CO₂ equivalent per kg)⁹⁷. Sustainable intensification of shellfish aquaculture in areas such as Lough Foyle may therefore offer an opportunity to shift to more sustainable meat production.

⁹² [DAFM. Aquaculture Policy \(2020\), retrieved 7 July 2021](#)

⁹³ [UK Climate Change Act 2008](#)

⁹⁴ [Ireland, Government, Climate Action and Low Carbon Development \(Amendment\) Bill 2021](#)

⁹⁵ [S. Cave, Bill Paper- Private Member Bill: Climate Change \(Northern Ireland\) Bill 2021, May 2021](#)

⁹⁶ [Climate Change Committee, Letter: Economic costs of setting and delivering a 2050 emissions target for Northern Ireland, \(April 2021\)](#)

⁹⁷ [M. MacLeod et al., 'Quantifying greenhouse gas emissions from global aquaculture', *Scientific Reports* \(2020\) 10:11679](#)

3 Marine system and management aims

Marine systems can be understood by considering economic **drivers** and **activities**, **pressures**, environmental **state**, **impacts** and management **responses**⁹⁸.

Marine activities in Lough Foyle are **driven** by demand for fisheries products, recreation, tourism, trade and transport. **Activities** create **pressures**, which change the **state of the environment**, resulting in **social impacts**. The Foyle Fisheries Commission and its successor, the Loughs Agency, was set up to **respond** to these issues (figure 3).

The Loughs Agency aims to promote sustainable fisheries management, develop commercial and recreational fishing, and develop marine tourism. This supports a wider aim, shared by the UK and RoI governments, to improve the cross-border Foyle environment to enhance people's lives, support sustainable development, and protect its rich resources⁹⁹.

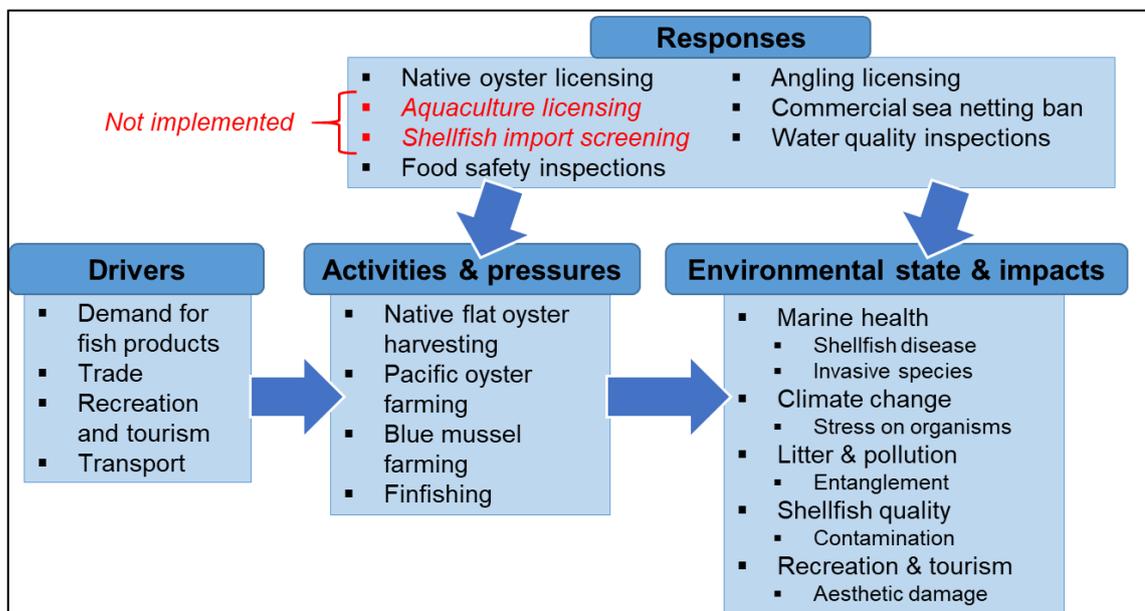


Figure 3 Drivers, activities, pressures, environmental state, social impacts and responses for Lough Foyle

The rest of this paper is structured as follows:

- Section 4 – Opportunities: **activities** and **pressures**.
- Section 5 – Risks: **environmental state** and **social impacts**.
- Section 6 – Ways forward: improving regulatory **responses**.

⁹⁸ J. Patrício *et al.*, 'DPSIR-Two decades of trying to develop a unifying framework for marine environmental management?', *Frontiers in Marine Science* (2016), 3:177

⁹⁹ Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Background and introduction* (July 2018)

4 Opportunities: activities and pressures

This section describes activities in Lough Foyle, their socio-economic benefits, and the pressures they place on the marine environment.

4.1 Native flat oyster harvesting

Native oyster (*Ostrea edulis*), also known as European flat oyster, occurs naturally in Lough Foyle. Native oysters grow naturally in shallow seas and estuaries and were common in the British Isles until the mid-nineteenth century, when they were overexploited¹⁰⁰. They are a keystone species, forming reefs that provide a habitat for other species. They reproduce sporadically and grow slowly¹⁰¹. Growth, yield and quality can be reduced by overharvesting and overstocking¹⁰². Native oyster harvesting has been regulated by the Agency since 2008. The Agency sets licences, closed seasons, minimum catch sizes, tagging conditions and landing areas annually, using scientific surveys¹⁰³¹⁰⁴. The Agency currently licenses 50 to 60 native oyster fishers, yielding 100 to 150 tonnes, valued at ~£400,000. The main export market is Spain¹⁰⁵.

4.2 Pacific oyster farming

Pacific oyster (*Magallana gigas*)¹⁰⁶ is not native to the British Isles. It was introduced to Ireland in 1965¹⁰⁷. It has since become the main aquaculture oyster species since it can be grown easily and productively on trestles¹⁰⁸. In Lough Foyle, seed Pacific oysters are imported and then grown on trestles on the foreshore¹⁰⁹. Although seed imports are reported to DAERA (NI) or the Marine Institute (RI), Pacific oyster cultivation is currently unregulated by the Loughs Agency. This gap has allowed unregulated cultivation to expand rapidly. There were around 2500 trestles in 2010-11¹¹⁰. A partial survey of ~25% of the foreshore in 2014 reported 2610 trestles¹¹¹. By 2018 this had increased to ~50,000, and has continued, to over 60,000 according to some reports¹¹². Production could be expanded in a sustainable manner if well-

¹⁰⁰ [I. Laing et al., 'Return of the native – is European oyster \(*Ostrea edulis*\) stock restoration in the UK feasible?', *Aquatic Living Resources* \(2006\), 19:283-287](#)

¹⁰¹ [Native Oyster Network, *European Native Oyster* \(2021\), retrieved 7 July 2021](#)

¹⁰² [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture* \(July 2018\)](#)

¹⁰³ [Loughs Agency, *Pre-fishery stock assessment Lough Foyle native oyster fishery* \(2020\), retrieved 7 July 2021](#)

¹⁰⁴ [Loughs Agency, *Confluence* \(2019\), retrieved 7 July 2021](#)

¹⁰⁵ ['Territorial dispute preventing aquaculture licensing on Foyle', *Donegal Live*, 17 Sept 2020, retrieved 7 July 2021](#)

¹⁰⁶ [CABI, *Magallana gigas \(Pacific Oyster\)* \(Jan 2021\), retrieved 7 July 2021](#)

¹⁰⁷ [Zwerschke et al., 'Co-occurrence of native *Ostrea edulis* and non-native *Crassostrea gigas* revealed by monitoring of intertidal oyster populations', *Journal of the Marine Biological Association of the United Kingdom* \(2018\), 98\(8\):2029-2038](#)

¹⁰⁸ [Trinity College Dublin, *Sustainability of Oyster fishery in Ireland* \(2021\), retrieved 7 July 2021](#)

¹⁰⁹ [Loughs Agency, *Pacific Oyster Farming in Lough Foyle* \(2021\), retrieved 7 July 2021](#)

¹¹⁰ [NIA OR 17 Nov 2016](#)

¹¹¹ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture* \(July 2018\)](#)

¹¹² ['Duffy: Resolution needed over Lough Foyle jurisdiction row', *Derry Daily*, 30 Jan 2021](#)

regulated¹¹³. In 2018 the Agency estimated that properly licensed oyster farming has a potential value of £20 million¹¹⁴.

4.3 Blue mussel farming

Blue mussel (*Mytilus edulis*), also known as common mussel, grows in subtidal beds around the world, including the British Isles. Seed mussels are dredged from these beds and taken to farms to be further grown on the seabed, on trestles, or on ropes¹¹⁵. In 2003, ~15,000 tonnes were grown in Lough Foyle, worth some £7 million¹¹⁶. The bottom-grown mussel industry has declined since 2007, but could become a significant industry again¹¹⁷. The Agency assesses the seabed stocks annually, although mussel cultivation is currently unlicensed.

4.4 Other shellfishing

According to a 2007 Cefas baseline survey of shellfish resources, other harvestable shellfish species include: green crab, velvet crab, lobster, clam, whelk, periwinkle and cockle¹¹⁸. The Loughs Agency does not currently have a legal function to regulate shellfish other than oysters and mussels.

Question:

- **How economically significant are shellfish other than oysters and mussels? What, if any, regulations exist concerning these?**

4.5 Commercial and recreational finfish fishing

Finfish are 'true' fish, as distinct from shellfish. Finfish in the Lough Foyle area are harvested commercially and recreationally. Lough Foyle and nearby seas have been important fisheries for centuries¹¹⁹. Greencastle and Moville in the RoI are important commercial fishing ports. Much of the deep sea fishing fleet is based at Greencastle¹²⁰. Londonderry Port/Port Foyle is a less commercially significant fishing port.

Salmon are listed under Annex II of the EU Habitats Directive¹²¹. In order to conserve stocks, commercial salmon drift netting was banned seaward of Lough Foyle in

¹¹³ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Benefits of Regulation* \(July 2018\)](#)

¹¹⁴ [Northern Ireland Affairs Committee, *Oral evidence: Brexit and Northern Ireland: Fisheries*, \(HC 2017-19, 878\) p.16](#)

¹¹⁵ [Loughs Agency, *Blue mussel aquaculture* \(2021\), retrieved 7 July 2021](#)

¹¹⁶ [J. Ferreira *et al.*, 'SMILE - sustainable mariculture in northern Irish lough ecosystems: assessment of carrying capacity for environmentally sustainable shellfish culture in Carlingford Lough, Strangford Lough, Belfast Lough, Larne Lough and Lough Foyle', *Institute of Marine Research* \(2007\)](#)

¹¹⁷ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture* \(July 2018\)](#)

¹¹⁸ [AQUAFACT, *Sanitary Survey Report and sampling plan for Lough Foyle* \(April 2010\), retrieved 7 July 2021](#)

¹¹⁹ [P. Boylan and C. Adams, 'The influence of broad scale climatic phenomena on long term trends in Atlantic salmon population size: an example from the River Foyle, Ireland', *Journal of Fish Biology* \(2006\), 68\(1\):276-283](#)

¹²⁰ [Angling Ireland, *Sea Fishing North East Donegal* \(2021\), retrieved 7 July 2021](#)

¹²¹ [OJ L 206, 22 July 1992, p.25](#)

2007¹²²¹²³. Meanwhile, netting within the Lough was restricted¹²⁴¹²⁵ and subsequently suspended in 2010¹²⁶. This was further consolidated by a wider ban on salmon net fishing through NI-wide regulations passed in 2014¹²⁷¹²⁸.

The Loughs Agency regulates recreational game and coarse angling on rivers, the shore and the sea. Angling requires a rod licence, with limits on the size and number of fish caught. On the Rivers Foyle and Finn, all fish caught must be released unharmed¹²⁹¹³⁰. The Agency also receives reports of illegal fishing activity via WaterWatch, such as illegal netting¹³¹.

Questions:

- **Lough Foyle is part of ICES Zone VIA: is there any distinction between this and open sea? If not, does this make quotas harder to manage?**
- **Are there plans or opportunities for finfish (e.g. salmon) aquaculture in the lough or sea? If so, what are the opportunities and risks involved?**

4.6 Recreation and tourism opportunities

Recreation and tourism opportunities include canoeing, boating, sailing, diving, shore fishing, coast walking and bird-watching. The Foyle Maritime Festival celebrates water-based activities along with music, food and arts. In 2018 it attracted over 200,000 attendees and generated ~£2 million for the local economy¹³².

¹²² [E. Britten. 'Ghost Boats and Human Freight: The Social Wellbeing Impacts of the Salmon Ban on Lough Foyle's Fishing Communities', In: J. Urquhart et al. \(eds\) *Social Issues in Sustainable Fisheries Management* \(2014\)](#)

¹²³ [Foyle Area \(Control of Netting\) \(Amendment\) Regulations 2007](#)

¹²⁴ [Foyle Area \(Control of Drift and Draft Net Fishing\) \(Amendment\) Regulations 2007](#)

¹²⁵ [Foyle Area and Carlingford Area \(Licensing of Fishing Engines\) \(Amendment No. 2\) Regulations 2007](#)

¹²⁶ [The Foyle Area \(Control of Fishing\) Regulations 2010](#)

¹²⁷ [Salmon Drift Net Regulations \(Northern Ireland\) 2014](#)

¹²⁸ [Salmon Netting Regulations \(Northern Ireland\) 2014](#)

¹²⁹ [Loughs Agency, *Carlingford Area and Tributaries Catchment Status Report 2018* \(Dec 2019\), retrieved 7 July 2021](#)

¹³⁰ [Loughs Agency, *Angling Guide Game, Coarse and Sea* \(2019\), retrieved 7 July 2021](#)

¹³¹ [Loughs Agency, *Illegal nets removed from the Foyle System* \(July 2020\), retrieved 7 July 2021](#)

¹³² [Loughs Agency, *Loughs Agency look forward to supporting the 2022 Foyle Maritime Festival* \(May 2021\), retrieved 7 July 2021](#)

5 Risks: environmental state and social impacts

This section describes changes in the state of the environment resulting from the activities described above and climate change, as well as their social impacts.

5.1 Marine health

Marine health can be threatened by biological agents such as pathogens, parasites and invasive non-native species¹³³. These agents may be unintentionally introduced by shellfish seed imports and shipping. NI shellfisheries generally have low levels of disease, although this may be threatened by aquaculture intensification and climate change¹³⁴.

Since the 1980s, the blood parasite *Bonamia ostreae* has been introduced to many European oyster fisheries, causing severe mortality¹³⁵. Bonamiosis disease was detected among Foyle oysters in 2005. It is believed to have been introduced on mussels containing oyster spat (sessile larvae)¹³⁶. This has begun to cause mortality¹³⁷, although infection levels remain low¹³⁸.

Marteiliosis is a disease caused by parasites in the *Marteilia* genus¹³⁹. It infects the digestive and connective tissues of bivalves (mussels and oysters), causing them to become emaciated. It has caused serious mortalities in European shellfisheries since 1968¹⁴⁰. There is a risk of unintentional Marteiliosis introduction through importation of seed oysters, particularly for unregulated aquaculture. The Loughs Agency wants strict regulation and management of imports to reduce this risk¹⁴¹.

Invasive non-native species can damage ecosystems and existing activities. The following species are established in Lough Foyle¹⁴²:

- Slipper limpet (*Crepidula fornicata*) can cover the sea floor, outcompeting native bivalves, thus posing a serious threat to native oysters¹⁴³.
- Japanese kelp (*Undaria pinnatifida*) can form dense forests, outcompeting native species and blocking light. It can also foul shellfish equipment and block harbours.

¹³³ [E. Peeler et al., 'Non-native aquatic animals introductions have driven disease emergence in Europe', *Biological Invasions* \(2010\) 13:1291-1303](#)

¹³⁴ [M. Fox et al., 'Preventing and mitigating farmed bivalve disease: a Northern Ireland case study', *Aquaculture International* \(2020\), 28:2397-2417](#)

¹³⁵ [C. Bromley et al., 'Bad moves: Pros and cons of moving oysters – A case study of global translocations of *Ostrea edulis*', *Ocean & Coastal Management* \(2016\), 122:103-115](#)

¹³⁶ [S. Culloty et al. 'Bonamia ostreae in the Native oyster *Ostrea edulis*', *Marine Environment and Health Series No. 29, Marine Institute* \(2007\)](#)

¹³⁷ [Loughs Agency, *Native Oysters* \(2020\), retrieved 7 July 2021](#)

¹³⁸ [G. Flannery et al. 'Investigating the significance of the role of *Ostrea edulis* larvae in the transmission and transfer of *Bonamia ostreae*', *Journal of Invertebrate Pathology* \(2016\), 136:7-9](#)

¹³⁹ [Cefas, *Disease data: Marteiliosis* \(2021\), retrieved 7 July 2021](#)

¹⁴⁰ [H. Sas et al., 'Bonamia infection in native oysters \(*Ostrea edulis*\) in relation to European restoration projects', *Aquatic Conservation: Marine and Freshwater Ecosystems* \(2020\), 30\(11\):2150-2162](#)

¹⁴¹ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture* \(July 2018\)](#)

¹⁴² [Loughs Agency, *Invasive species* \(2021\), retrieved 7 July 2021](#)

¹⁴³ [Loughs Agency, *114th Meeting of the FCILC* \(Feb 2019\), retrieved 7 July 2021](#)

- Japanese wireweed (*Sargassum muticum*) forms dense strands, blocking light and nutrients to native species, covering eelgrass beds, and clogging pipes.
- Smooth cordgrass (*Spartina alternifolia*) and common cordgrass (*S. anglica*) form dense swards, outcompeting native plants and blocking mudflats to birds^{144,145}.

Other species have the potential to become established and invasive:

- Pacific oysters are known to escape cultivation, and may start to compete with native oysters and other species¹⁴⁶. Previously limited by cool sea temperatures, warmer seas mean they are able to reproduce and spread more easily, meaning they could become 'naturalised' or 'invasive'¹⁴⁷.
- Chinese mitten crab (*Eriocheir sinensis*) feeds on native fish and burrows into river banks, causing subsidence.
- Carpet sea squirt (*Didemnum vexillum*) can smother the sea floor, vessels and equipment. It has been estimated that continued growth could cost UK mussel farms £1.3 million to £6.8 million over the next ten years¹⁴⁸.

Question:

- **What measures are needed to mitigate the risks from pathogens, parasites and invasive non-native species?**

5.2 Climate change

Climate change is affecting the physical and chemical properties of the sea, potentially harming marine ecosystems¹⁴⁹. Global sea surface temperatures are warming faster than global air temperatures, and Irish Sea surface temperatures are projected to increase by 2 to 3°C by 2100¹⁵⁰. Sea levels around NI are projected to increase by 0.2 to 1 m by 2100 compared to 1981-2000¹⁵¹. Globally, seawater is becoming more acidic, and around the UK, seawater pH could decrease by 0.35 by 2100. Global dissolved

¹⁴⁴ [Native Species Ireland, Common cordgrass \(2020\), retrieved 7 July 2021](#)

¹⁴⁵ [M. Hammond and A. Cooper, 'Spartina anglica eradication and inter-tidal recovery in Northern Ireland estuaries', *Proceedings of the International Conference on Eradication of Island Invasives* \(2002\), 27:124-131](#)

¹⁴⁶ [Zwerschke et al., 'Co-occurrence of native *Ostrea edulis* and non-native *Crassostrea gigas* revealed by monitoring of intertidal oyster populations', *Journal of the Marine Biological Association of the United Kingdom* \(2018\), 98\(8\):2029-2038](#)

¹⁴⁷ [N. King et al. 'Climate change accelerates range expansion of the invasive non-native species, the Pacific oyster, *Crassostrea gigas*', *ICES Journal of Marine Science* \(2021\), 78\(1\):70-81](#)

¹⁴⁸ [Loughs Agency, Carpet Sea Squirt, retrieved 28 September 2021](#)

¹⁴⁹ [Marine Climate Change Impacts Partnership, Report Card 2020, retrieved 7 July 2021](#)

¹⁵⁰ [J. Tinker and E. Howes, 'The impacts of climate change on temperature \(air and sea\), relevant to the coastal and marine environment around the UK', *MCCIP Science Review* \(2020\), 1-30](#)

¹⁵¹ [Met Office, UKCP18 Marine Report \(Nov 2018\), retrieved 7 July 2021](#)

oxygen concentrations have decreased by 2% since the 1960s, and in UK waters may decrease by 5 to 11% by 2100¹⁵².

Sea warming, rising, acidification, de-oxygenation, and changes in salinity will place pressures on existing marine organisms and ecosystems. Warmer seas stress cold-adapted species, and allow new diseases to proliferate. For example, *Paramoeba perurans* – the cause of Amoebic Gill Disease in salmon – is associated with higher temperatures¹⁵³. Meanwhile, the Herpes virus OsHV-1 μ var, may kill more Native and Pacific oysters. Similarly, invasive species (see section 5.1) may be better able to establish and spread.

Rising sea levels may cause shellfish beds to move from deeper waters to newly submerged areas. Acidification, de-oxygenation and salinity changes alter living conditions for marine organisms. For example, acidification inhibits the growth and survival of organisms with calcium-based shells such as plankton, oysters and mussels. Although the impacts on fisheries are uncertain, bivalves may be more susceptible than other marine organisms¹⁵⁴. In combination, these climate-related pressures make Lough Foyle's fisheries more susceptible to damage. However, these risks can be mitigated through proactive management and biosecurity¹⁵⁵.

Question:

- **Would empowering the Loughs Agency to regulate shellfishing in Lough Foyle allow it to sufficiently mitigate these risks through measures such as screening shellfish seed stock for disease?**

5.3 Litter and pollution

Lough Foyle is being littered by general waste and aquaculture equipment such as plastic trestle bags and tags, and rubber securing bands¹⁵⁶. Marine wildlife may ingest plastic waste, be entangled or poisoned. Aquaculture licensing would allow the Loughs Agency to monitor and regulate aquaculture waste management¹⁵⁷.

Pollution enters Lough Foyle from multiple sources, primarily from agricultural runoff but also from untreated wastewater and construction works^{158,159}. For example, a fish kill event on the River Faughan in 2016 was blamed on a farm silage spill¹⁶⁰, and an

¹⁵² [C. Mahaffey et al. 'Impacts of climate change on dissolved oxygen concentration relevant to the coastal and marine environment around the UK' *MCCIP Science Review* \(2020\), 31-53](#)

¹⁵³ [C. Collins et al., 'Impacts of climate change on aquaculture', *MCCIP Science Review* \(2020\), 482-520](#)

¹⁵⁴ [C. Collins et al., 'Impacts of climate change on aquaculture', *MCCIP Science Review* \(2020\), 482-520](#)

¹⁵⁵ [M. Fox et al., 'Preventing and mitigating farmed bivalve disease: a Northern Ireland case study', *Aquaculture International* \(2020\), 28:2397-2417](#)

¹⁵⁶ ['Plastic is not fantastic as fears grow for Lough Foyle'. *Derry Daily*, 10 May 2018](#)

¹⁵⁷ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture* \(July 2018\)](#)

¹⁵⁸ [Loughs Agency, *107th Meeting of the FCILC* \(Dec 2017\), retrieved July 2021](#)

¹⁵⁹ [Loughs Agency, *Meenbog Peat Slide Multi-Agency Update* \(May 2021\), retrieved 7 July 2021](#)

¹⁶⁰ ['River Faughan fish kill: Silage spill suspected'. *BBC*, 3 Aug 2016](#)

extensive incident occurred on the River Aghlisk in 2021¹⁶¹. The Agency monitors river water quality to enable it to respond to pollution incidents¹⁶². The Catchment CARE and SWELL partnership projects aim to understand and address pollution issues¹⁶³¹⁶⁴.

Questions:

- **How significant a problem is litter and pollution?**
- **Do transboundary pollution events pose a particular challenge?**
- **Is the Loughs Agency adequately equipped at present to deal with the complexities of transboundary pollution?**
- **Does the Loughs Agency require new powers to tackle litter and pollution?**

5.4 Shellfish product quality

Good marine management, including pollution control, is needed to maintain high shellfish quality, food safety standards and positive public perception. Although aquaculture is unregulated, the Loughs Agency collects samples for the Food Standards Agency (NI) and Sea Fisheries Protection Agency (RoI). These are tested for biotoxins and *E. coli*. Lough Foyle is a 'class-B' shellfish water due to faecal contamination, meaning shellfish must be purified prior to human consumption¹⁶⁵¹⁶⁶. Furthermore, poor husbandry of unregulated aquaculture and sales of untested products could present a risk to consumer safety, and undermine the public perception of Lough Foyle aquaculture¹⁶⁷.

Questions:

- **Would there be significant environmental and economic benefits to improving Lough Foyle's water quality, such as securing 'class-A' shellfish water classification?**
- **If so, how can the Loughs Agency and other stakeholders improve water quality?**

¹⁶¹ [Loughs Agency, Pollution incident on the Aghlisk River, Co Tyrone \(May 2021\), retrieved 7 July 2021](#)

¹⁶² [Loughs Agency, Freshwater Pollution Response Implementation Plan \(2015\), retrieved 7 July 2021](#)

¹⁶³ [Loughs Agency, Catchment Care \(2021\), retrieved 7 July 2021](#)

¹⁶⁴ [Loughs Agency, SWELL \(2021\), retrieved 7 July 2021](#)

¹⁶⁵ [UK Food Standards Agency, List of Northern Ireland's classified shellfish beds and their associated harvesting areas \(March 2021\), retrieved 7 July 2021](#)

¹⁶⁶ [Centre for Environment, Fisheries and Aquaculture Science, Shellfish classification and microbiological monitoring \(2021\), retrieved 7 July 2021](#)

¹⁶⁷ [Loughs Agency, Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture \(July 2018\)](#)

5.5 Recreation and tourism

Intensive unregulated aquaculture may displace recreation and tourism activities. For example, the trestles affect the aesthetic quality of the Lough, and in some instances could endanger boat users¹⁶⁸.

¹⁶⁸ [Loughs Agency, *Written Submission to the Northern Ireland Affairs Committee: Unregulated Aquaculture* \(July 2018\)](#)

6 Ways forward: improving regulatory responses

This section outlines possible ways forward to improve regulatory responses to the issues described above. It describes actions available to policy makers to facilitate the sustainable management of Lough Foyle.

The Loughs Agency is the legal ‘aquaculture licensing authority’. However, the jurisdictional ambiguity and lack of a management agreement leaves the Agency powerless to discharge many of its functions, in particular regulating rampant Pacific oyster aquaculture. A resolution will require action by the legislatures in London, Dublin and to a lesser extent, Stormont (since the foreshore is a reserved or excepted matter). It may also require the cooperation of The Crown Estate.

In 2018 the Northern Ireland Affairs Committee concluded:

‘The dispute over maritime boundaries has resulted in environmental damage and economic disadvantage to the Lough Foyle area. The cause of the current crisis is the failure of the Irish and UK Governments to either resolve the jurisdictional issue or reach a management agreement for Lough Foyle’¹⁶⁹.

It recommended:

‘...that the Foreign and Commonwealth Office concludes a management agreement with the Irish Government, within the next 12 months, that enables the Lough’s Agency [sic] to fully implement the 2007 Foyle and Carlingford Fisheries Order. We further recommend that the Agency be given the extra resources necessary to remove existing unlicensed oyster trestles’.

In its response the UK Government stated:

‘The Government recognises the need to take action to address illegal shellfish farms that have been established on the side of Lough Foyle that borders Ireland. The management of these activities falls into two parts - the leasing of the lough-bed on which the trestles are erected, and the licensing of activities taking place in Lough Foyle. We are committed to working constructively towards a practical resolution to the issue. Discussions between the UK and Irish Governments are progressing on the jurisdictional issues with a view to concluding a management agreement to address this activity’¹⁷⁰.

¹⁶⁹ [Northern Ireland Affairs Committee, *Brexit and Northern Ireland: Fisheries Fourth Report of Session 2017-19*, \(HC 2017-19, 878\)](#)

¹⁷⁰ [UK Government, *Brexit and Northern Ireland: fisheries: Government Response to the Committee’s Fourth Report* \(Dec 2018\)](#)

The signing of a management agreement *may* not require a complete resolution of the complex issue of maritime national boundaries. Carlingford Lough is also an important commercial harvesting area for blue mussels and oysters¹⁷¹, and has finfishing, and marine tourism¹⁷². Although there is no legally agreed national maritime boundary in Carlingford Lough, there is a pragmatic informal agreement to use the lough's centre line as the jurisdictional boundary¹⁷³. It is not clear whether such an agreement would be feasible at Lough Foyle.

Questions:

- **Is it reasonable to believe that Carlingford Lough presents a workable solution to lough management within the context of jurisdictional ambiguity?**
- **Could the management agreement reached in Carlingford Lough also demonstrate a helpful approach for Lough Foyle?**
- **What factors and features within the Carlingford Lough management arrangements are directly comparable to those within Lough Foyle? Conversely, what are the distinct differences?**

¹⁷¹ [D. Lawlor, 'Implementation of the Marine Strategy Framework Directive on the island of Ireland: a critical appraisal of policy, law and governance'. Presentation at Environmental and Planning Law Association of Northern Ireland Conference, 26 June 2013](#)

¹⁷² [C. Schéré *et al.* 'It's Just Conservation: To What Extent Are Marine Protected Areas in the Irish Sea Equitably Governed and Managed?' *Frontiers in Marine Science* \(2021\), 8:668919](#)

¹⁷³ ['A disputed Irish-UK territory is one of many fishing problems caused by Brexit'. *The Journal*, 30 Dec 2017](#)