

INTEGRATED COASTAL ZONE MANAGEMENT PLAN

LOCH Fyne



Argyll and Bute Council
Development Services

LANGUAGE TRANSLATION GUIDE

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Integrated Coastal Zone Management Plan

Loch Fyne

A Spatial Planning Framework
for Future Development

December 2009

Marine & Coastal Development Unit, Planning Services, Argyll & Bute Council

Funded by



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Scottish Natural Heritage
All of nature for all of Scotland

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Acknowledgements

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Foreword

The coastal area of Argyll and Bute is exceptional and is one of our prime assets. It provides a unique resource from which present and future economic, social, and environmental well-being can be derived. It is a living and working environment, home to a large proportion of Argyll and Bute's population, and hosts a great diversity of industrial and recreational activities, each playing an important role in the area's economy.

The Argyll and Bute Council Structure Plan outlines the Council's objectives for coastal planning and emphasises the necessity of working with all the relevant sectors to fully harness the productive capacity of the marine and coastal area, whilst safeguarding its unique environmental qualities through sustainable development.

This plan has been designed to complement the Argyll & Bute Development Plan (Structure and Local Plan) and will be a significant piece of guidance for the use and development of the coastal zone of Loch Fyne over the next five years. The plan aims to assist decision-making in relation to development proposals, help minimise conflicts of interest and guide future investment. The policies and recommendations have been formulated after reviewing the current use of the area and identifying key coastal management issues and development opportunities. Underpinning the entire process has been extensive consultations with local communities, stakeholders and relevant and competent authorities.

Our aspiration is that this plan will be used by these same groups and organisations, to guide sustainable management of the coastal and marine resource, in order to secure the future of both the natural environment and the economic needs of the communities that are dependent on it.



A handwritten signature in blue ink, reading "Robert MacIntyre".

Councillor Robert MacIntyre
Depute Leader, Argyll and Bute Council

1. Introduction

Marine planning and decision-making to date has been very sectoral with limited joined-up thinking or consideration of other users of the area. Given the recent development pressures on coastal areas of Argyll and Bute, and the competition for space between sectors such as fishing, aquaculture, recreation and tourism, there is a need for a more integrated approach to deliver the sustainable use of our marine resources. There is also a need to take fuller account of the socio-economic characteristics of the coastal area and provide a framework for the promotion of local economic development.

Integrated Coastal Zone Management (ICZM) is a process by which these issues can be addressed:

The objective of ICZM is to establish sustainable levels of economic and social activity in our coastal areas while protecting the environment. It brings together all those involved in the development, management and use of the coast within a framework that facilitates the integration of their interests and responsibilities

Department for Environment Food and Rural Affairs (DEFRA), 2006

Argyll and Bute Council secured funding in July 2004 to initiate the Loch Fyne ICZM project as a means of accomplishing the sustainable management of this significant marine area.

1.1 National and International Context for Marine and Coastal Planning

The UK and Scottish Government are subject to international obligations to protect and manage the marine environment under instruments such as the World Summit on Sustainable Development, OSPAR, EU Marine Strategy Framework Directive, Water Framework Directive, Birds and Habitats Directives and Convention on Biological Diversity.

At a UK level, DEFRA are working towards the introduction of a UK Marine Bill at the end of 2008. In Scotland, the Scottish Government are currently consulting on proposals for a Scottish Marine Bill which includes a new legislative and management framework for the delivery of sustainable economic growth in the marine environment. In addition, proposals relate to reducing the regulatory burden, nature conservation, and improving our understanding of the seas, with delivery through a Scottish marine management organisation. A three-tier structure for marine planning in Scotland is proposed, which comprises an 'international level' beyond Scotland, a 'Scotland level', and a 'regional level' within Scotland. Marine planning at the scale of the Loch Fyne ICZM plan would sit within the regional level of this proposed structure.

The Scottish Marine Environment Initiative (SSMEI), led by the Scottish Government, is currently testing the delivery of marine planning locally through a series of pilot projects. One of these four projects is developing a strategic marine spatial plan for the Firth of Clyde, including Loch Fyne, with which this more localised plan will need to integrate.

To promote rural development and sustainable resource management, the Scottish Government has previously developed national strategies for aquaculture, sea fisheries, agriculture and forestry. In addition, there are a number of National Planning Policy Guidelines (NPPGs) and Scottish Planning Policies (SPPs) that are relevant to the development of this plan. The Scottish Government are consolidating all existing SPPs and NPPGs into a single SPP which will become a single statement of national planning policy.

1.2 Local Context for Coastal Planning

The Argyll and Bute Structure Plan 2002 provides a strategic overview for future development of the land and sea area of Argyll and Bute and outlines the Council's objectives for coastal planning.

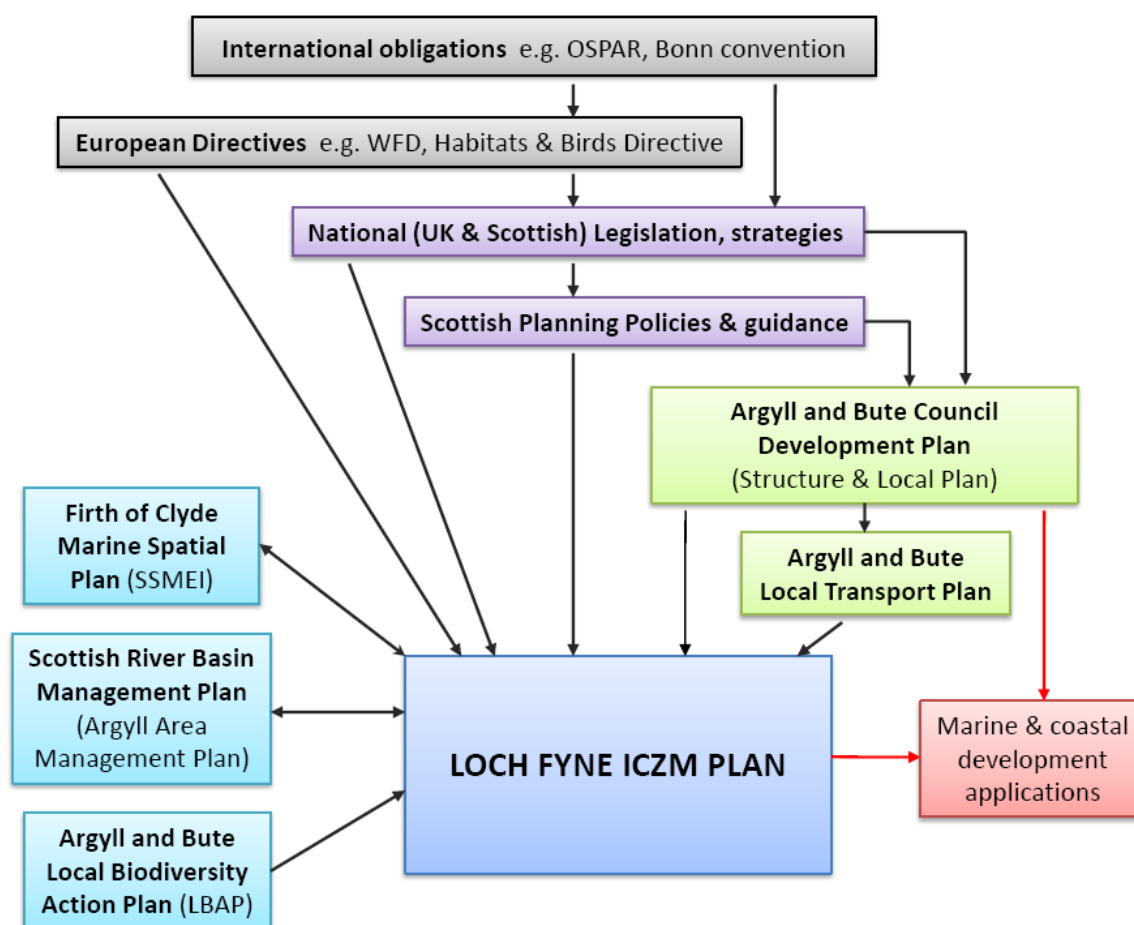
It recommends the preparation of Coastal Framework Plans for seven priority coastal areas, including Loch Fyne, and sets out that these plans should be developed by working with the Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH), the local enterprise companies, neighbouring authorities, other partner and community organisations and interest groups. The knowledge and expertise of existing coastal fora and the tripartite working groups should also be harnessed to contribute to the coastal framework planning process.

In line with the Structure Plan, the Local Plan supports the evolution of the coastal planning process to further inform the assessment of marine aquaculture development in Argyll & Bute. The Loch Fyne ICZM plan will therefore be a material consideration in the determination of planning applications for aquaculture development.

1.3 Integration with Other Plans and Policies

Integration with other plans and policies is vital to ensure compliance with the requirements of international, EU, UK and Scottish policy instruments and to avoid duplication of effort. The diagram below is a schematic representation of the relationship between the Loch Fyne ICZM plan and other plans and policies at local, national and international levels.

Plans and policies taken into account in the development of this plan are listed in Appendix II.



1.4 Aims of the Integrated Coastal Zone Management Plan

The Loch Fyne ICZM plan is non-statutory and aims to provide guidance for Argyll and Bute Council planners, other regulators and stakeholders on the future use and development of the marine waters and surrounding coast of Loch Fyne for the next five years (2010 – 2015).

An ICZM project was set up with the aim of establishing a dynamic stakeholder group through which the ICZM process could occur, and to develop an Integrated Coastal Zone Management plan with broad community input and support, that would:

- Guide and advise local authority planners, regulators and stakeholders on future use and development;
- Assist decision-making in relation to development proposals;
- Help minimise conflicts of interest and guide future investment;
- Secure the long-term sustainable use of the marine resources within Loch Fyne;
- Fulfil the coastal framework plan requirements outlined by the Council's Structure Plan, and
- Complement Argyll & Bute Development Plan (Structure and Local Plan).

This plan should be used in conjunction with the Argyll and Bute Development Plan (Structure & Local Plan), which includes policies relevant to various types of development in the coastal zone, including aquaculture, harbours, piers and marinas. An overview of Argyll and Bute Development Plan policies that are particularly relevant to this plan is provided in Appendix I.

Given the Council's new responsibilities for aquaculture, particular emphasis is placed on developing policies to help guide future aquaculture development to appropriate areas by taking account of other activities and environmental sensitivities. These policies and guidance on scale and location of new aquaculture development will be used by Argyll and Bute Council as supplementary planning guidance and will be a material consideration in the determination of planning applications for new or modified aquaculture developments.

In addition, the plan identifies potential conflicts of interest between activities and highlights broader issues for the attention of the relevant agencies and marine users in the form of recommendations.

1.5 Loch Fyne ICZM Group

A group with a broad community and stakeholder composition was established and coordinated by Argyll and Bute Council's Marine and Coastal Development Unit. This group was encouraged to become involved in a voluntary management process that facilitated the following:

- Identification and discussion of issues facing the coastal area;
- Development of co-operation between stakeholders, and
- Provision of co-ordinated action to generate sustainable development and integrated management.

The entire process has involved extensive consultation through public meetings, one to one meetings and correspondence. Information, agreements and recommendations from this group have been fed into the development of the plan.

1.6 Plan Outline

There are four main parts to this plan which are summarised below:

Site Description

Section 2 provides a background to Loch Fyne, describing its geology, oceanography, natural heritage interests, historic interests, and issues such as invasive non-native species, climate change and water quality.

Current Activities

Section 3 provides an overview of the current status of all the major activities within the loch. Information is presented on current management initiatives where they occur, socio-economic importance, future development considerations and recommendations on future management, use and development of Loch Fyne. These recommendations were developed by Argyll and Bute Council's Marine and Coastal Development Unit, based on information gathered and discussions with stakeholders and regulators throughout the development of this plan.

Local issues and agreements are also presented, where issues were discussed in detail within the Loch Fyne ICZM group and agreements to resolve these issues reached.

Policy Zone Section – Area Policies and Guidance

The policy zone section looks at Loch Fyne in distinct areas of coast (policy zones) and describes the characteristics, current activities and uses. Opportunities and constraints for future development and use are identified. The methodology behind the determination of constraints, opportunities and the potential for aquaculture development is described in Section 4.

Section 5 is the main section of the plan and provides area guidance for the future use and development of Loch Fyne. It should be used by local authority planners, regulators and stakeholders to assist decision-making in relation to development proposals, help minimise conflicts of interest, and guide future use and investment. Policies within this section identify where different types of aquaculture development may be appropriate, with guidance on location, scale and consultees to be consulted. Where these policies indicate presumption in favour of development, this will be subject to any development proposal being consistent with relevant policies within the Argyll and Bute Development Plan (Structure and Local Plan).

Development Opportunities

Finally, Section 6 summarises opportunities for future use and development that have been identified in the policy zone section and provides additional guidance and advice where appropriate, including relevant Argyll and Bute Development Plan policies that need to be considered.

The main development opportunities that are discussed in this section include finfish and shellfish aquaculture, shellfish ranching, development of new or improved coastal infrastructure to promote recreational boating and other activities, and opportunities for improved access or development of dedicated access for recreational activities such as boating, diving and angling.

2 Site Description

Loch Fyne (Figure 2.1) is both the longest and the deepest of Scotland's sea lochs (Davies 1989), with a length of approximately 70 km and a maximum depth of around 185 m (Edwards & Sharples 1985, Dipper & Beaver 1999). Loch Fyne's coastline is extensive at 173 km and the loch is naturally divided into an upper and lower section at Otter Spit.

As a whole, Loch Fyne offers a diversity of coastal character, from the narrow, relatively confined inner reaches of the loch, to the more expansive outer loch which merges seamlessly with the extensive seascapes of Kilbrannan Sound and the Sound of Bute. While much of the coastline is relatively linear and regular in shape, stretches of a more convoluted shoreline of enclosed bays and well-defined promontories can be found along both the east and west coasts (Grant 2007).

The variety is also enhanced by the diversity of settlement pattern and varying degrees of remoteness which occur along the coast. Occasional towns and small settlements, roads and features of historic interest are the primary coastal developments, while semi-native woodland frequently extends down to the foreshore along less developed shorelines (Grant 2007).

A large-scale patchwork of forestry plantation and wild, open moorland dominates the hills surrounding Loch Fyne. Situated on the younger Argyll Group of Dalradian metamorphic rocks, the hills are lower and support more forest than the Cowal ridges. The area extends along the edges of Loch Fyne, from the loch head at Glen Fyne down to Lochgilphead on the western edge, and down to the Kyles of Bute on the eastern shore. Large forestry plantations such as Strathlachlan Forest cloak the hillsides; these contrast with the wild and open moorland, which shows no sign of enclosure and is remote and inaccessible (Scottish Natural Heritage 1996).

Loch Fyne itself has a distinctive character; hotels stand on the loch edge giving views across, and reflections in the water. Development is concentrated around the edges of the loch, where the road wraps tightly around the edges. Views across the sheltered loch are stunning and castles enhance the experience. Pressures from tourism are therefore inevitable in this area (Scottish Natural Heritage 1996).

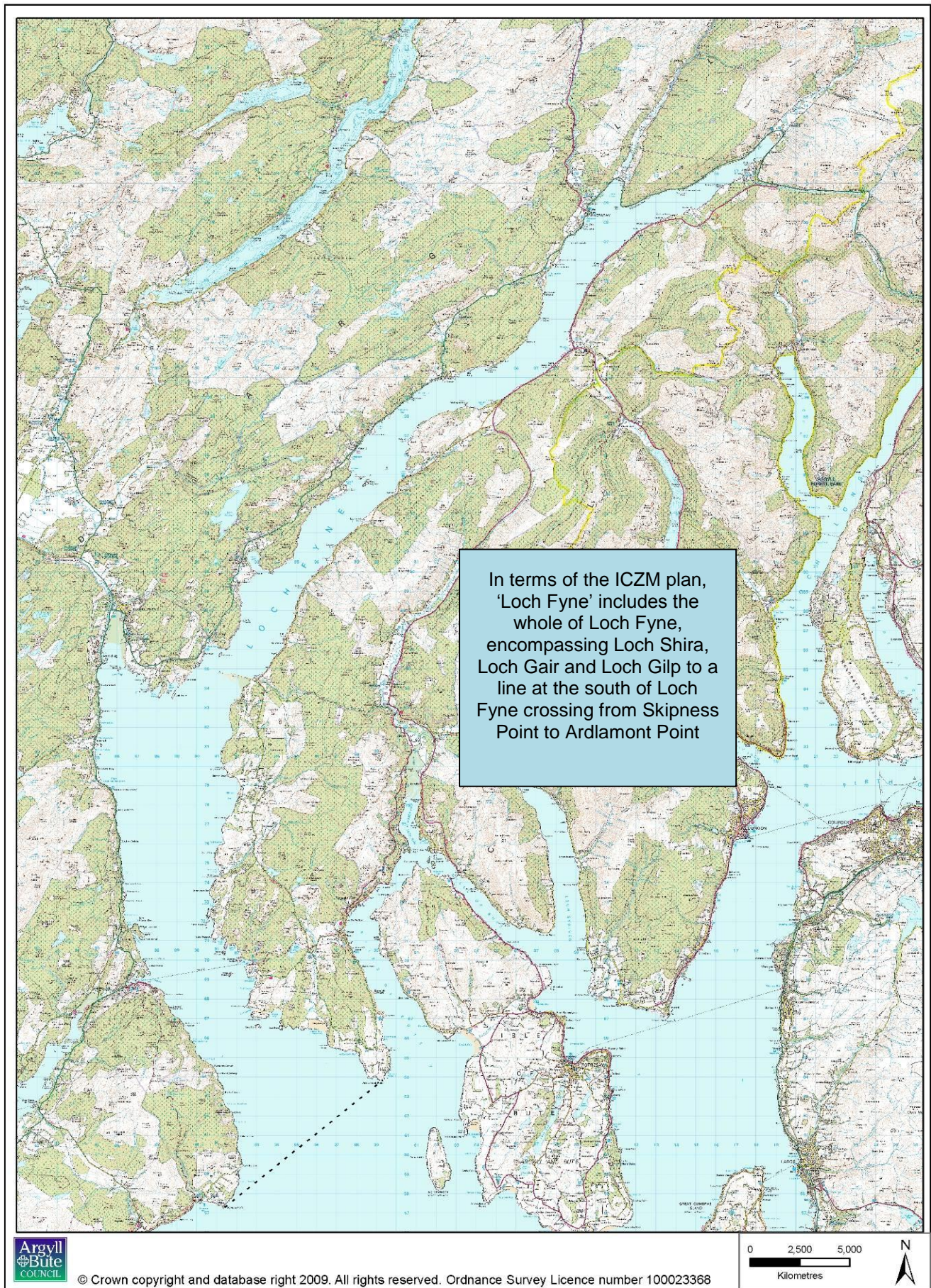


Figure 2.1 Loch Fyne and surrounding area

2.1 Geology

Loch Fyne is long and narrow with two sills; one in the upper loch at Minard near the group of small islands, and another at Otter Ferry by the sandy spit; the remains of a large glacial terminal moraine. The littoral zone of the loch is generally steep-sided composed of mostly bedrock. However, the area has mixed sediment shores (predominately sand or gravel underlying pebbles, cobbles or boulders) at the head of Loch Fyne and Loch Gilp, the north side of Otter Spit, the south bay of Barmore Island and the areas of St Catherine's, Loch Gair, Strachur Bay, Kilfinan Bay, Auchalick Bay and Ardmarnock Bay. These areas consist of mixed substrate and are influenced by streams and rivers (Dipper & Beaver 1999). The broad-scale geology and surface sediments are shown in Figures 2.2 and 2.3.

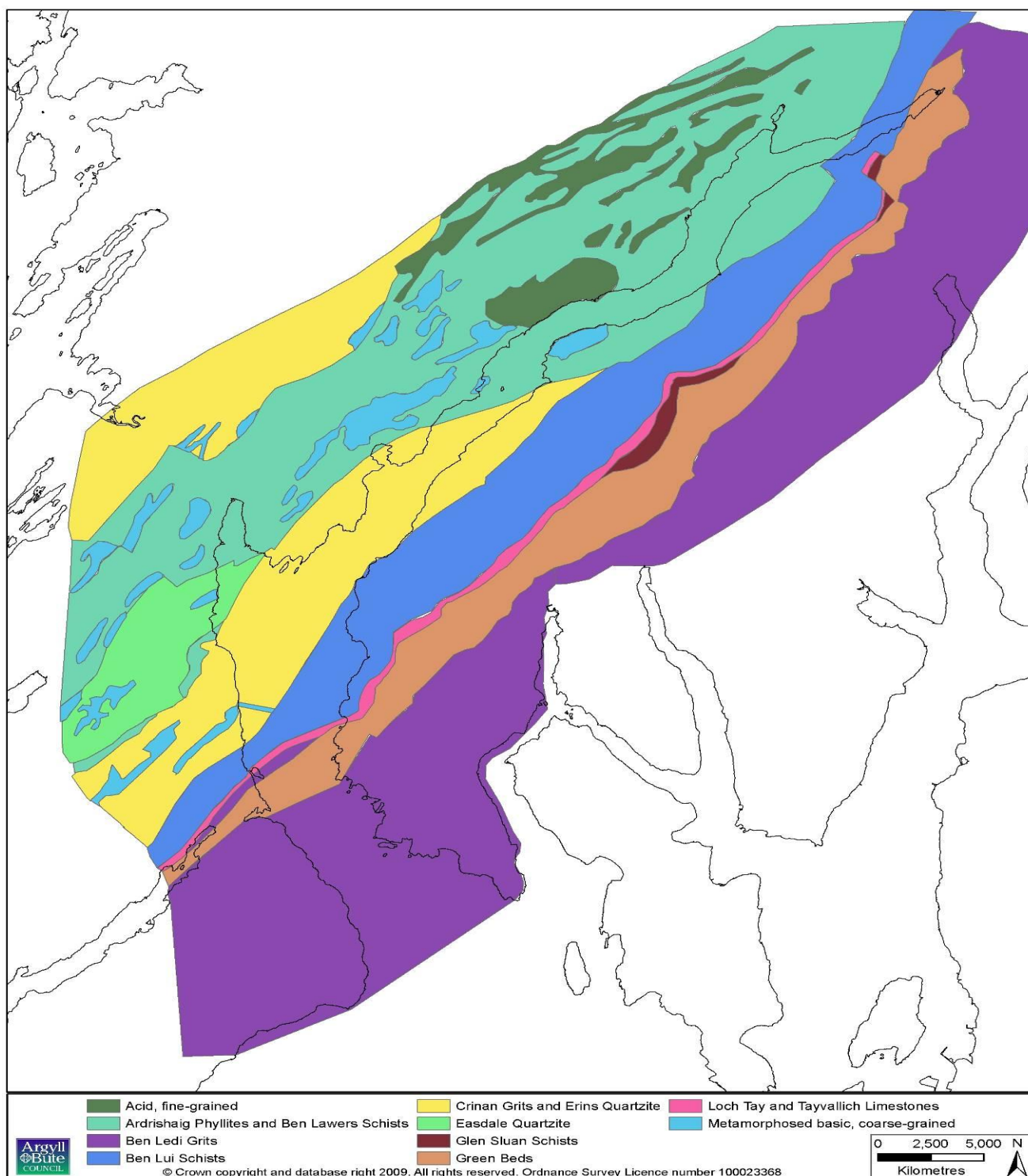


Figure 2.2 Geology of Loch Fyne area (data digitised from Davies 1989)

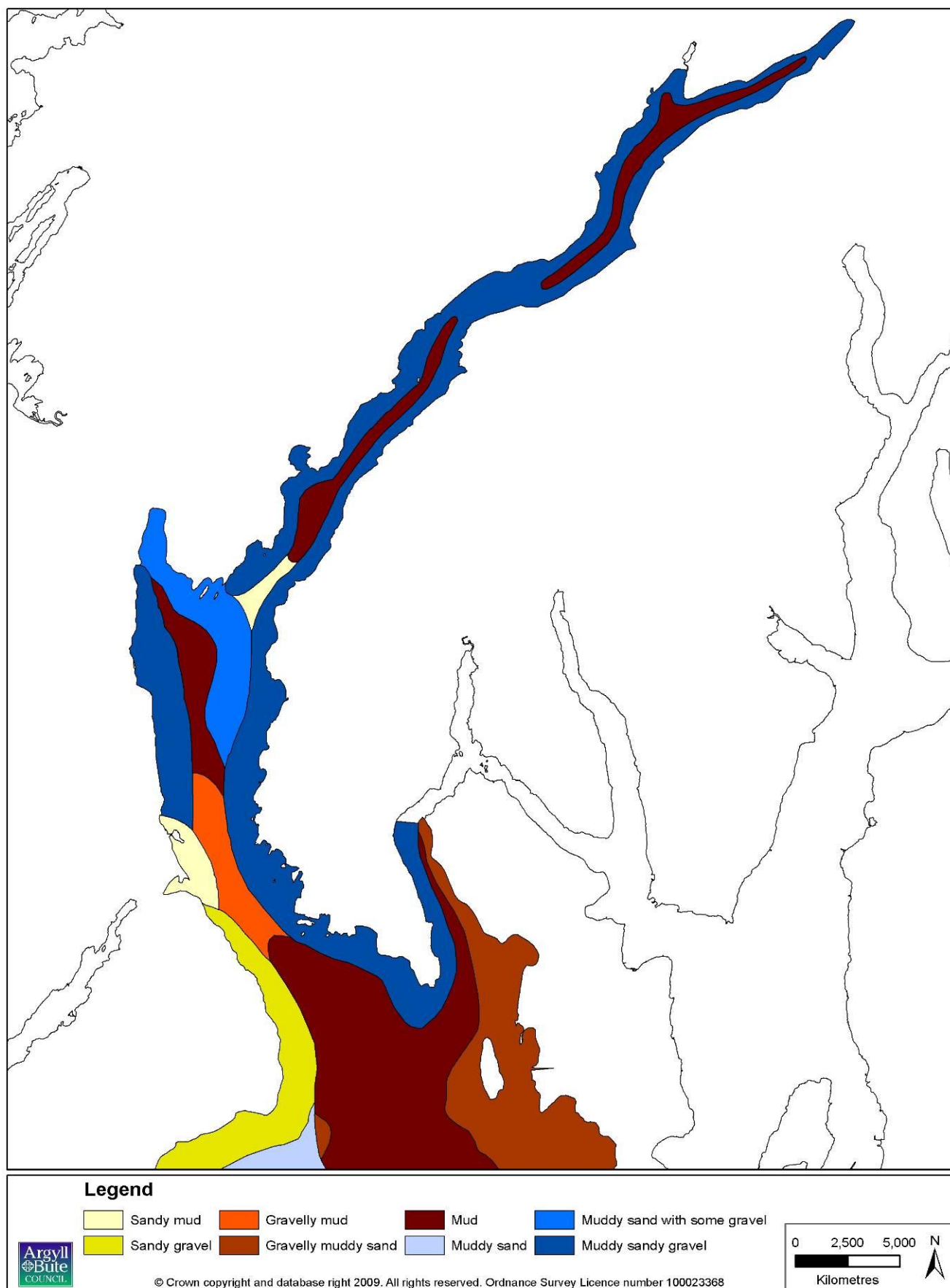


Figure 2.3 Surface sediments of Loch Fyne area (data digitised from Davies 1989)

2.2 Oceanography

The loch is entirely marine, apart from the north of Newton Bay and in the upper reaches of Loch Gilp, where the salinity can vary. The tidal range in Loch Fyne is 3.1 m during spring tides at Tarbert and Inveraray, and ranges between 1.8 and 2.5 m for these sites during neap tides. It has an estimated water exchange period of 13 days (Edwards & Sharples 1985), but deep water within the basins is subject to an annual cycle of flushing. A summer thermocline separates warmer surface water from colder deeper waters which stagnate until winter, when the thermal layering breaks down and water body circulation flushes the basins. Loch Fyne is generally sheltered from prevailing south-westerly winds by Kintyre and Mid Argyll, but may on occasion develop larger waves or swells due to the orientation of the upper loch. Tidal streams are generally quite weak with the exception of the Otter Spit narrows where flow rates may reach 1.1 knots. Tidal currents are on average stronger and the seabed profile becomes deeper closer to the shore on the western side of the loch.

2.3 Natural Heritage Interests

Loch Fyne is an area rich in scenery with a diverse range of marine and coastal habitats and wildlife which attract visitors to the area to appreciate its natural qualities. All of the designated sites, habitats and species in or bordering Loch Fyne are of at least regional significance with many being of national or European importance. The relative importance of these interests is summarised in Appendix IX.

2.3.1 Designated sites

There are a number of sites around the immediate coast designated for species, habitats, geology and landscape, and these are shown in Figure 2.4. A description of the different types of designations can be found in the Glossary. Landscape designations are discussed in section 2.3.4.

Special Area of Conservation (SAC)

Tarbert Woods SAC is located south of East Loch Tarbert and is designated for Western acidic oak woodland.

Sites of Special Scientific Interest (SSSI)

There are four SSSI's bordering or immediately adjacent to Loch Fyne.

- Tarbert to Skipness Coast: designated for upland oak woodland and bryophyte assemblage;
- Artilligan and Abhain Strathain Burns: designated for upland oak woodland;
- Strone Point, North Loch Fyne: designated for geological interest, Dalradian structural and metamorphic geology;
- Ardchylene Woods: designated for ancient, semi-natural woodland.

Strone Point SSSI is strategically positioned close to the centre point of the large scale Dalradian fold in the rock layer sequence known as the 'Tay Nappe', where extensive studies have been undertaken.

National Nature Reserve

Mealdarroch NNR, located south of East Loch Tarbert is part of the Tarbert to Skipness Coast SSSI.

Marine Consultation Area

Upper Loch Fyne, north of a line between Dalchenna Point and Creag a' Phuill, is designated as a Marine Consultation Area mainly for its dense populations of the fireworks anemone *Pachycerianthus multiplicatus*, and because the sublittoral communities present are a characteristic of deep water sea lochs.

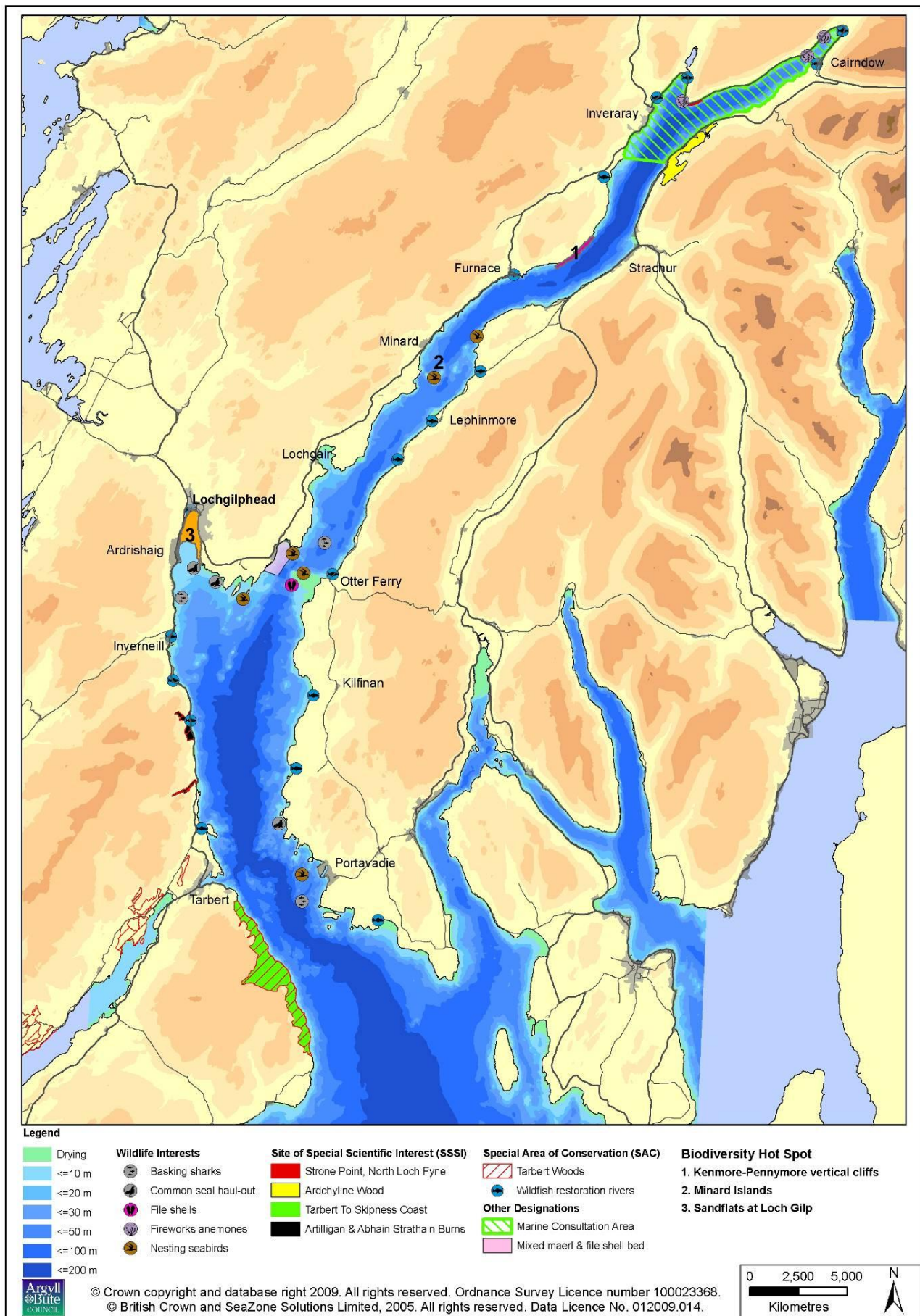


Figure 2.4 Location of natural heritage interests: designated sites, habitats and species of biodiversity interest, areas of biodiversity interest and wildfish rivers

2.3.2 Biodiversity Action Plan Species and Habitats

Figure 2.4 shows the location of habitats and species of biodiversity interest. The most up to date published data¹ and local knowledge has been used to produce this map. However, as is generally the case with the marine environment full, detailed sea bed survey coverage of the loch does not exist. As a result, there is a need to update much of the existing information on important areas for biodiversity and therefore recommendations in section 3.12 of the plan encourage further Seasearch and other more formal surveys of these areas.

Argyll and Bute Local Biodiversity Action Plan (LBAP)

The following priority habitats and species listed in the Argyll and Bute LBAP are present in Loch Fyne and are of both national and regional importance.

Priority habitats – Mud Habitats in Deep Water, Mudflats, Coastal Saltmarsh, Seagrass beds and Horse Mussel Beds

Priority species – Basking Shark, Bottlenose Dolphin, Harbour Porpoise and Atlantic Salmon

UK List of Priority Species and Habitats

The UK List of Priority Species and Habitats was updated in 2008 and now includes additional species and habitats that are well-represented in Loch Fyne. The fireworks anemone *P. Multiplicatus*, maerl species *Lithothamnion corallioides* and *Phymatolithon calcaerum*, as well as Atlantic salmon *Salmo salar* and Brown/sea trout *Salmo trutta* are now priority species. Beds of the file shell *Limaria hians* are now a priority habitat.

2.3.3 Areas of Biodiversity Interest

Comparatively, in biological terms, Loch Fyne hosts a limited range of communities and habitats compared with other west coast lochs (Davies 1989). This is probably due to lower complexity in water movements. However, there are parts of the loch that are of biological significance.

Head of Loch Fyne

The seabed of Loch Shira and around Strone Point is home to one of the densest populations of the deep water fireworks anemone (*P. Multiplicatus*) known in the UK. This population has been the focus of numerous surveys (Paisley 2005 & 2006; Davies 1989). A recent Seasearch survey in April 2008 recorded additional dense populations at two sites at the head of the loch, near Ardgenavan (Paisley 2008).

Fields of the slender seapen (*Virgularia mirabilis*) have also been recorded in this area and there is a small amount of seagrass (*Zostera marina*) occurring in scattered patches in the shallow water of Loch Shira. Loch Shira is also an important nursery area for salmon and sea trout. Coastal saltmarsh at the head of Loch Fyne holds a wide range of plant communities and is important for wading birds and wildfowl. A small area of coastal saltmarsh is also present in Lachlan Bay at the mouth of the Strathlachlan River.

Otter Narrows

Loch Fyne is divided in two by Otter Spit. The spit itself is an important area for nesting seabirds and waders, and supports dense mussel (*Mytilus edulis*) beds. An increase in water flow generally increases the diversity and abundance of marine life present and the Otter Narrows is no exception. Currents can exceed one knot at the tip of Otter Spit, which leads to an increase in the abundance and diversity of hydroids and sea anemones on the boulder and cobble substrate (Davies 1989).

Away from the main current, large areas are covered in dense brittlestar beds, mainly the black serpent star (*Ophiocomina nigra*), but also the fragile brittlestar (*Ophiothrix fragilis*).

¹ (Craik 2000; Davies 1989; Davies 1989(b); Dipper & Beaver 1999; Edwards & Sharples 1985; Howson & Davies 1988; Mccluskey 1986; Paisley College of Technology 1978-9; Paisley 2005; Paisley 2006; Paisley 2008; Ridley 1986; Ritchie 1975; Scottish Natural Heritage 2008; Selkie Associates 2001)

A large maerl bed is located in the subtidal zone to the west of Otter Spit. This calcareous algae provides a rigid reef structure which supports a diversity of marine life. Live maerl has been shown to be an important reserve for juvenile queen scallops. Alongside and mixed in with the maerl is also a file shell (*L. Hians*) bed formed by the 'nests' these shellfish make to protect themselves from predators. File shell beds are becoming increasingly rare and this is thought to be one of the largest known and most important beds in Scotland (Selkie Associates 2001).

Loch Gilp

At low tide some of the largest sand and mud flats in mainland Argyll are exposed between Lochgilphead and Ardrishaig. Mudflats are highly productive habitats that support large numbers of predatory birds and fish. They provide feeding and resting areas for internationally important populations of migrant and wintering waterfowl and are also important nursery areas for flatfish. Loch Gilp attracts oystercatchers, eider ducks, redshank, herring gulls, great black backed gulls, mute swans and shelduck. In winter months the approaches to Loch Gilp often hold significant numbers of divers and seaduck.

In addition to Otter Spit and Loch Gilp, there are several small islands that are important for nesting or roosting seabirds, including Kilbride Island, the islands at Minard narrows, the island of Clach Garbh north of Otter spit and Eilean Buidhe, west of Portavadie.

Extensive areas of eel grass (*Z. marina*) have been reported in the lower areas of Loch Gilp (McLusky 1986), although the current state of these beds is unknown. Common seals are resident in Loch Fyne and there are various haul out sites between Loch Gilp and the Otter narrows.

Kenmore Point to Pennymore Point

At Minard Narrows, and between Kenmore Point and Pennymore Point, there are stretches of near vertical cliffs that in places drop from the surface to depths in excess of 30 m (Davies 1989). The tide swept cliffs of this area (of which include the Minard Islands) are covered in a variety of sponges, brachiopods, anemones, sea squirts and peacock worms.

Central basins of Loch Fyne

The BAP habitat 'Mud habitats in deep water' is common within the central basins of the loch. The biotope (Sea pens and burrowing megafauna in circalittoral soft mud) is typical of the deep mud habitats of Scottish sea lochs (Howson 1988) (www.marlin.ac.uk). This habitat is well-represented in Argyll and Bute and supports a diverse flora and fauna, although in Loch Fyne and indeed the rest of the Clyde Estuary, the rare and fragile tall sea pen *Funiculina quadrangularis* has not been recorded.

Lower Loch Fyne

Apart from the physiographic value in the general coastal area of lower Loch Fyne, Ritchie (1975) suggested that Auchalick Bay should be declared a SSSI because of its ornithological and other wildlife interests. The area is considerably rich with a variety of habitats, where marsh, saltmarsh, backshore and strandline habitats are well represented (Ritchie 1975). Kilfinan Bay was identified as being of comparable interest to Auchalick Bay, in particular in relation to its ornithological interest (Ritchie 1975).

Outer Loch Fyne often hosts groups of harbour porpoise (*Phocoena phocoena*), bottlenose dolphins (*Tursiops truncatus*) and basking sharks (*Cetorhinus maximus*). Minke whales (*Balaenoptera acutorostrata*) have also been sighted on occasion. Basking sharks are often seen in the summer months throughout the outer central areas of Loch Fyne with sightings common from the Tarbert to Portavadie ferry in some years.

All species of cetacean are protected under the Habitats Directive wherever they occur as European Protected Species. In addition, the basking shark is listed and protected under Schedule 5 of the Wildlife and Countryside Act 1981.

There is a record of dead maerl at Skipness Point and off Ardlamont Point, where there is an extensive bed of dead maerl at 5-13 metres depth.

2.3.4 Landscape

Landscape designations

There are no National Scenic areas bordering the coast of Loch Fyne. Areas of Panoramic Quality have been designated by Argyll and Bute Council in the Argyll and Bute Development Plan (Structure & Local Plan). These areas are important for not only their physical landforms and for the flora and fauna which they support, but also for the environmental assets that they represent. The locations of these designations are presented in the 'Loch Fyne Overview Map' and in each individual policy zone map in section 5.

2.3.5 Additional information on Natural Heritage interests

A wide range of further information is available from the following sources:

Scottish Natural Heritage (Sitelink) - Information on designated sites, <http://www.snh.org.uk/snhi/>

Argyll and Bute Council: Local Biodiversity Action Plan, <http://www.argyll-bute.gov.uk/biodiversity>

MarLIN: The Marine Life Information Network – Information on the sensitivity of marine habitats and species, <http://www.marlin.ac.uk/bacs.php>

SeaSearch – Information on voluntary marine surveys, <http://www.seasearch.co.uk/>

UKBAP website - UK List of Priority Species and Habitats & action plans, <http://www.ukbap.org.uk/NewPriorityList.aspx>

RSPB - <http://www.rspb.org.uk/> - Information on birds and wildlife

2.3.6 Safeguarding Natural Heritage

Nature Conservation (Scotland) Act 2004

Under the Nature Conservation (Scotland) Act 2004, all public bodies have a duty to further the conservation of biodiversity and the Scottish Biodiversity Strategy.

There are a range of environmental policies in the Argyll and Bute Development Plan, which aim to safeguard key environmental assets and guide new development to locations that minimise environmental impacts. The most relevant policies for marine and coastal development are listed in Appendix I.

2.3.7 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Natural Heritage Interests – **Recommendations 12, 23, 29 – 31, 38; Good Practice 1, 2, 5 – 7, 9, 10.**

2.4 Wild Migratory Salmonids

Atlantic Salmon are widely distributed in Argyll, usually spending two years in rivers as fry and parr before migrating to sea as smolts. Most salmon (grilse) spend one winter at sea before returning, although some remain at sea for two or more years before returning to spawn; these are known as multi-sea winter fish. The abundance of salmon in most of Argyll's rivers has severely declined in recent years (Argyll Fisheries Trust 2008).

The fishery for wild salmonids in Loch Fyne has collapsed and the historical benefits to the local community and economy have been lost. Activities are underway to address the primary marine-based factors that have significantly affected the fishery. Of most significance is the on-going work with aquaculture companies in the Firth of Clyde Area Management Agreement (AMA), which has significantly improved wild and farm fish health in Loch Fyne.

18 rivers with a catchment of over 5 km² and 4 rivers with a catchment of over 30 km² run into Loch Fyne. Many of these rivers are important for Atlantic salmon and sea trout, but catches of these species within the loch have declined since the 1980s. Figure 2.5 illustrates the decline of grilse and salmon between 1952 and 2006. Potential reasons for this decline may be due to a decrease in marine survival in the wider Atlantic Ocean for salmon, and a decrease in marine survival in local sea lochs for salmon and sea trout. A decrease in freshwater survival locally may be attributed to: the introduction and possible spread of sea lice from escaped farmed fish; interbreeding between escapees; disease; commercial forestry; drainage; overgrazing; hydropower, and over exploitation in or near freshwater environments (Argyll Fisheries Trust 2005).

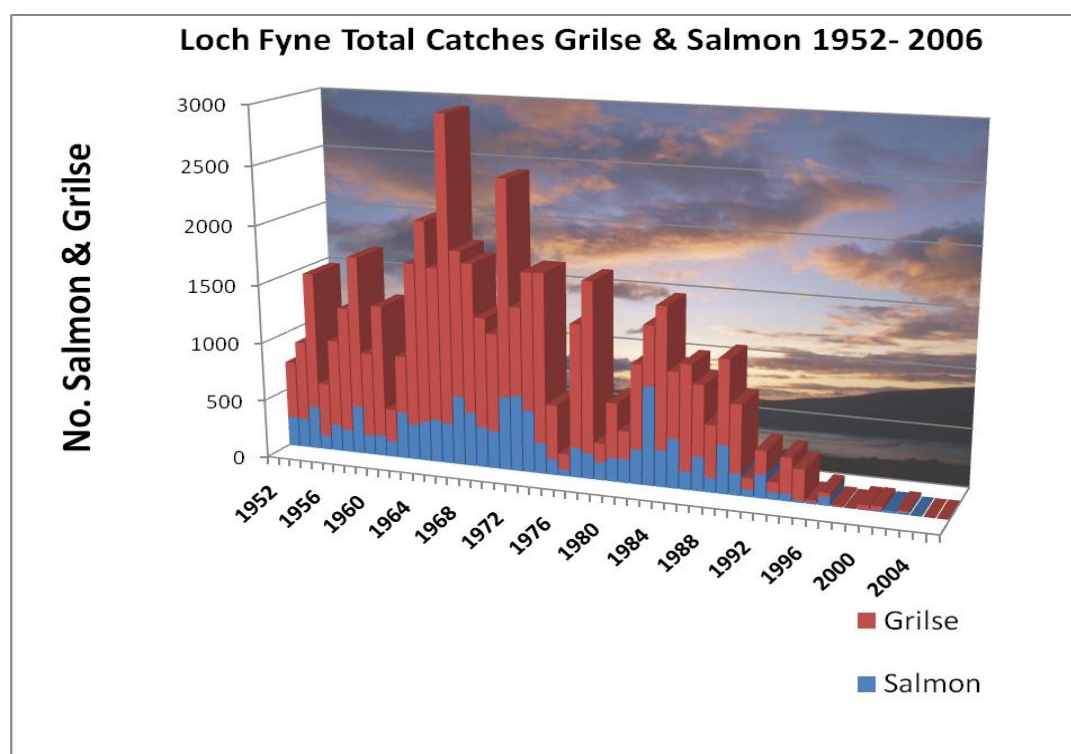


Figure 2.5 Total catches of grilse and salmon in Loch Fyne between 1952 and 2006 (Argyll Fisheries Trust 2008)

Many of the rivers of the Loch Fyne area are part of a juvenile salmon and brown trout restoration project funded by Argyll Fisheries Trust. This project aims to maximise spawning escapement, improve habitats and access to them, restock areas using local produce via a hatchery, raise public awareness and conduct monitoring. The location of these rivers is shown in Figure 2.4. Regular fish and habitat surveys together with genetic studies, hatchery support and management are an ongoing process.

The development of the Area Management Plan for Argyll, as part of the Scotland River Basin Management Plan (RBMP) and associated restoration funding will take forward actions to improve the water environment, which should in turn have benefits for wildfish populations.

2.4.1 Salmon and Trout Angling

Loch Fyne has supported both recreational rod and line fisheries and commercial netting for salmon and sea trout. However, net fisheries are no longer operational in Loch Fyne with the last one closing in 2002 in an attempt to conserve the low number of migratory fish returning to the area (Argyll Fisheries Trust 2005). Additionally, there is now only a limited catch and release fishery for salmon and sea trout on the eighteen river systems flowing into the loch.

Under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003, written permission is required for salmon and sea trout fishing in any fresh waters, including any part of the sea within 1.5 kilometres of mean low water springs in Scotland. Full details and legal requirements can be located on the Fish Britain website <http://www.fishpal.com/Scotland/Legal.asp?dom=Britain>.

2.4.2 Recommendations

The following 'Recommendations for Future Management, Use and Development', outlined in Section 3.12 are relevant to Wild Migratory Salmonids – ***Recommendations 3, 4, 17, 34, 35, 38; Good Practice 2 & 5.***

2.5 Archaeological and Historical Sites

Marine and coastal archaeological and historical interests are identified in the relevant policy zones (Section 5) and have been considered in the development of guidance on future use and development for each zone. Further information on individual interests can be accessed from the Historic Scotland website: <http://www.historic-scotland.gov.uk/> and/or the Past Map website www.pastmap.org.

The setting of historic landmarks and features were included in the sensitivity analysis of the landscape/seascape capacity assessment for aquaculture, and has been considered in section 5, when determining development potential.

2.5.1 Coastal Interests

Listed buildings, scheduled ancient monuments and their surroundings, historic gardens and designed landscapes, conservation areas, and special built environment areas are all subject to special protection measures to ensure that inappropriate or unsympathetic development does not damage the property or its setting.

A large number of important archaeological and historical interests are present along the coastline Loch Fyne. Of particular interest are the quality and disproportionately high significance of some buildings and monuments at Inveraray, Ardkinglas, Stonefield and Tarbert. Some of the most important coastal interests are described in Table 2.1 and their location presented in Figure 2.6.

Table 2.1 Description of a selection of listed buildings and scheduled ancient monuments of high importance, in proximity to the coastline of Loch Fyne. Information from Historic Scotland (<http://hsewsf.sedsh.gov.uk>)

Site no.	Name	Description
1	Ardkinglas House	Category A listed mansion in Scottish style around open court. Built for Sir Andrew Noble of Ardmore in 1906 on the site of former Mediaeval Ardkinglas Castle (strong-hold of the Campbells of Ardkinglas), which had been destroyed in 1769. One of Sir Robert Lorimer's greatest works.
2	Dunderave Castle	Category A listed building. Built in 1596 as the seat of the MacNaughtons. Fell into ruin but restored by Sir Robert Lorimer. Acquired by Sir Andrew Noble in 1905 as part of Ardkinglas Estate.
3	Inveraray	Numerous listed buildings throughout the town are renowned for their cultural heritage, especially the main street and also the church and pier. Inveraray Castle (category A) is highly significant nationally and was built as the seat for the Dukes of Argyll, replacing the previous castle near the current site.
4	Crarae Gardens & Cairn	Gardens of rare and exotic trees and shrubs. Home to a good example of a Clyde chambered cairn.
5	Brainport	Standing stones - solar alignment during the summer solstice.
6	Minard Castle	Category B listed building built in 1848 for John Pender MP. Recently converted into a Hotel.
7	Old Lachlan Castle	Scheduled ancient monument category A listed building built in 1450. Anciently, the seat of MacLachlans until 1746 when it was attacked and fell into ruin. Some preservation works have been carried out.
8	The Castle (Point House)	Category B listed building, early 19th century. Gothic.

9	Otter Ferry	Pier: Category C listed, built in early 19 th century for ferry (long out of use) to West Otter Ferry, Glassary Parish. Otter Ferry House category C listed built in the latter 18 century.
10	Ballimore House	Category B listed building from the late 19 th century. Scots Baronial style. Formerly called Otter, but when the estate changed hands in the earlier 19 th century the name
11	Inverneil	Church: Category C listed. Built in 1775 of Georgian style. Previously one of the 2 parish churches of south Knapdale, but disused since 1860. Walled gardens and summer houses: Category B listed from early 18 century.
12	Erins House	Category B listed building, Scots Baronial style. Previously domestic mansion of the Furlongs, now converted to flats.
13	Stonefield Castle	Category B listed building, Scots Baronial style. Built for John Campbell of Stonefield. Stonefield was a major design by William Playfair, dated 1855. This Gothic Revival is now a hotel.
14	Tarbert	Tarbert Castle: category B listed building, built between 1325-1330, but now a ruin. Scheduled Monument. Royal Castle reconstituted by Robert I to overawe Highlands. Several listed buildings in town and around harbour. Tarbert Harbour Walls and weighbridge: built 19 th century, category B listed. Engineered by Thomas Telford as part of a plan of Commissioners for Highland Roads and Bridges to improve communication channels.

2.5.2 Marine Interests

A number of wrecks listed in the National Monument Record of Scotland are present in Loch Fyne (Figure 2.6). The Historic Scotland website (www.historicscotland.com) provides information on what to do if you find a wreck that may be of historic importance and obligations to report material recovered from wrecks.

Historic Scotland encourages public appreciation of, and involvement in the recording and conservation of underwater heritage. Scottish Ministers wish to develop and publish policy in relation to the marine historic environment and to take forward proposals for new legislation to protect marine historic assets on the seabed of Scotland's territorial waters (from Mean High Water and out to 12 nautical miles offshore). The intention is for new legislation to be in place in the period 2010–13 which is likely to be taken forward through the proposed Scottish Marine Bill.

When considering new marine developments and mitigation of potential effects on marine archaeological and historic interests, developers should consider Historic Scotland's operational policy paper *HP6 Conserving the Underwater Heritage* (www.historic-scotland.gov.uk) and the *Code of Practice for Seabed Development* (www.inapc.org.uk/index.htm)

2.5.3 Safeguarding Archaeological and Historic Interests

Historic Scotland, an executive agency of the Scottish Government, is charged with safeguarding the nation's historic environment and promoting its understanding and enjoyment. Argyll and Bute Council have a responsibility to protect and support the retention of features or sites of archaeological and historical importance in the development plan process and will expect developers to take account of these interests when submitting planning applications.

There are a range of policies in the Argyll and Bute Development Plan, which aim to safeguard key archaeological and historic interests and guide new development to locations that minimise impacts. The most relevant policies for marine and coastal development are listed in Appendix I.

2.5.4 Good Practice

The following 'Good Practice', outlined in Section 3.13 is relevant to Archaeological and Historic Sites – **Good Practice 3.**

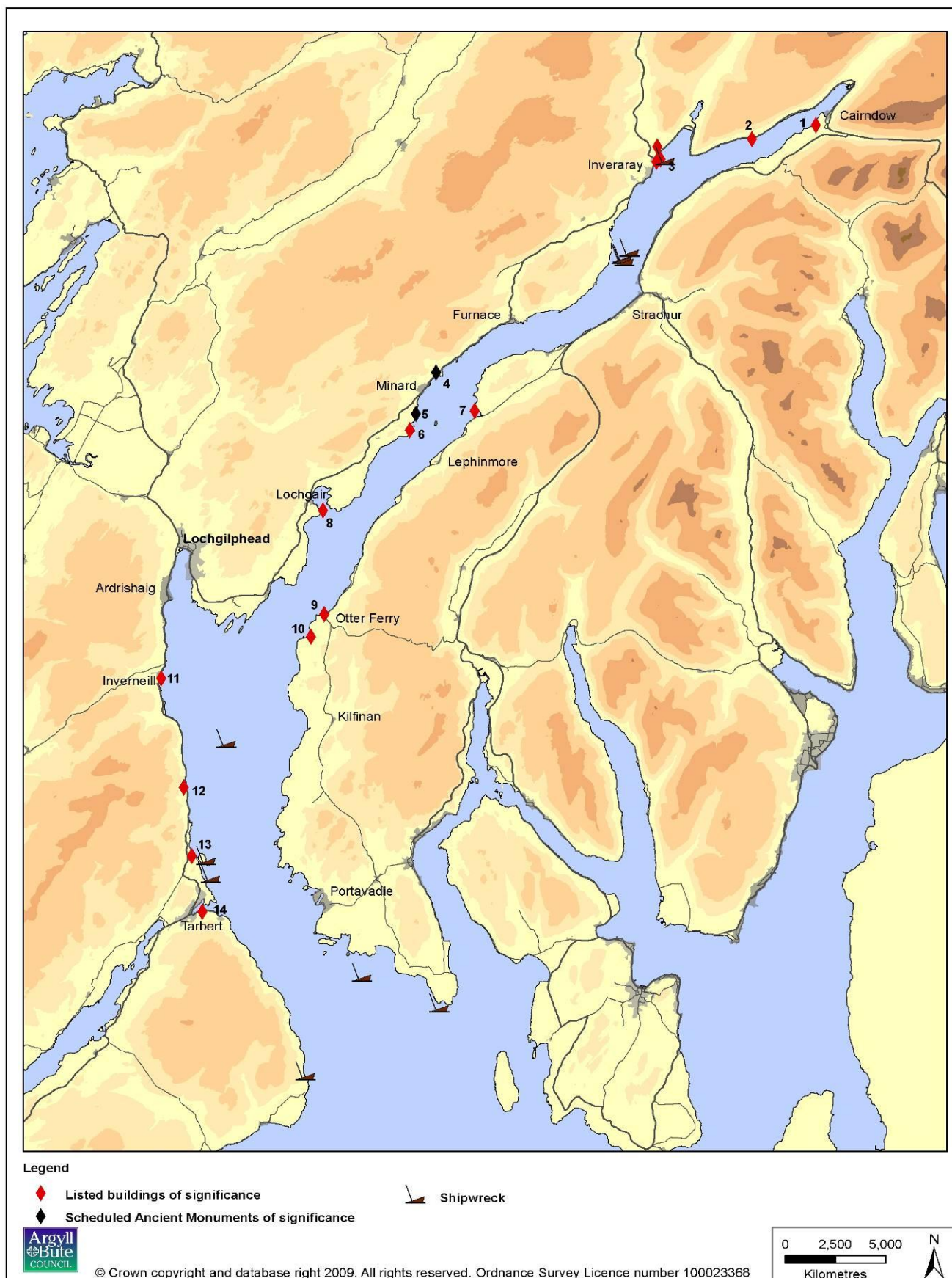


Figure 2.6 Location of the main listed buildings and scheduled ancient monuments of importance and disproportionately high significance in close proximity to the coastline of Loch Fyne.

2.6 Invasive non-native marine species

2.6.1 Background

Invasive non-native species are non-native organisms that successfully establish themselves, presenting a potential threat to the environment and the native species living there as they may out-compete the native species, change environmental conditions, or completely take over the new environment. Invasive non-native species are considered to be the second greatest threat to global biodiversity, after habitat destruction. It is estimated that there are around 79 marine and brackish non-native species present in Britain and around 24 of these are present in Scotland (Baxter *et al.* 2008).

Activities such as shipping or aquaculture can inadvertently introduce invasive species to our waters. Shipping can transport species either in ballast water and sediments or as biofouling i.e. attached to the hull, anchor chains or other niches around the vessels hull. Some species can also be transported naturally by ocean currents or wind or may travel attached to floating objects such as seaweed or plastic containers.

2.6.2 Marine and coastal threats

Potential threats of introduction of Invasive Non-Native Species (INNS) into Argyll come from those species that are not currently found in Scotland but are present in neighbouring countries and could have access through one or more pathways to Scotland (Kettle-White 2006).

Marine

The large brown seaweed *Sargassum muticum*, also known as wireweed, was recorded in Loch Fyne in 2006. However, recent surveys (SNH 2008) indicate that the spread of wireweed in Loch Fyne is not yet extensive. Wireweed causes problems by competing with native seaweeds and seagrasses through over-growing, shading and abrasion. It is considered a nuisance in harbours and shallow waters where large floating masses may become a hazard to commercial and recreational boating through entangling in propellers or blocking engine cooling systems. The floating mats can also affect water-sports such as swimming, wind surfing and sailing. Wireweed can also foul fishing nets and lines and can seriously impact on oyster beds and other aquaculture structures.

The Japanese skeleton shrimp *Caprella mutica* is a relatively large, robust caprellid amphipod native to north-east Asia. This species is now widespread in Scottish coastal waters, occurring in high numbers on artificial structures such as mooring ropes and nets at aquaculture sites, and on pontoons and boat hulls in marinas. *C. mutica* is also found on a range of natural substrata such as hydroids and algae. It is often found in association with *S. Muticum* (MarLIN 2008).

The biggest current threat to Atlantic salmon populations and the fisheries they support is the parasite *Gyrodactylus salaris*. The potentially catastrophic consequences of its introduction mean that it is a priority for fisheries and aquaculture industries to identify and mitigate potential vectors (Kettle-White 2006).

Coastal

Japanese knotweed (*Fallopia japonica*) has spread along rivers and the coast by movement of plant fragments by water, and is found in many other areas through the movement of plant debris in soil and on vehicles. It forms dense thickets to exclude native plants, prohibits regeneration, reduces biodiversity and alters the habitat for wildlife.

The American Mink (*Mustela vison*) spreads by migration and kills water fowl, small mammals, juvenile salmon and trout.

2.6.3 Existing management and controls

Risks are currently minimised through existing regulations (Wildlife and Countryside Act 1981²; The Fish Health Regulations 1997 (SI 1997 No 1881)); the International Council for the Exploration of the Sea (ICES) Code of Practice (2005) and a forthcoming strategy on invasive non-native species. In addition, the Scottish Association of Marine Science run a Marine Aliens Project³ that aims to map their current distribution, predict their spread and impact on native biodiversity, identify potential control methods and to raise awareness of their presence in UK coastal waters.

SNH launched a Species Action Framework⁴ in 2007 which in part focuses on invasive non-native species including Wireweed and the American mink. Guidance on identifying and reporting sightings of invasive non-native marine species, including wireweed can be found in Appendix III.

Argyll Fisheries Trust are currently developing a Biosecurity Management Plan for Argyll and the Islands, that aims to establish a sustainable framework that will lead to the prevention, detection, control and eradication of invasive non-native species. This will be undertaken through the application of appropriate management activities, data collection, liaison, education and legislation. Further information is available from <http://www.argyllfisheriestrust.co.uk>

2.6.4 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Invasive Non-native Marine Species – **Recommendations 16; Good Practice 2 & 5.**

² Under section 14 of The Wildlife and Countryside Act 1981, it is prohibited to introduce any non-native or hybrid species to Great Britain.

³ www.marlin.ac.uk/marine_aliases

⁴ <http://www.snh.org.uk/speciesactionframework/saf-background.asp>

2.7 Water Quality

The water environment of Loch Fyne is very important for recreation, leisure, fisheries, transport, fishing and aquaculture. Many of these uses are economically dependent on a high quality water environment which makes its protection important. Aquaculture, in particular shellfish farming, relies on excellent water quality to support the growth of the species concerned and enable the final product to meet strict hygiene standards.

2.7.1 Factors that can affect water quality

Diffuse pollution - Both agriculture and forestry can affect the water environment through diffuse pollution. Forestry operations can result in silt run off and acidification of water courses and agriculture can be a source of nitrogen input and bacterial contamination to coastal waters.

Point source pollution – Discharges

Bivalve shellfish species can accumulate human pathogenic micro-organisms, including bacteria and viruses when grown in sewage-polluted waters. There are several point source discharges around Loch Fyne from commercial, wastewater treatment and private, residential outfalls.

Climate Change

Rising water temperatures and greater nutrient run-off as a result of higher intensity rainfall events could exacerbate algal blooms and eutrophication.

Litter and waste

About 80% of marine litter originates from land and up to 90% of the waste consists of plastics which may persist for considerable periods of time. Litter has an economic cost in blocking water intakes, getting wrapped round boats propellers or simply the cost of physically removing it from beaches (Baxter *et al.* 2008).

2.7.2 Management of the water environment

River Basin Planning

The Scottish Environment Protection Agency (SEPA) is the lead body in the preparation of a River Basin Management Plan (RBMP) for the Scotland river basin district. River basin planning is a strategic decision-making process that integrates the management of land and water within river basin districts to deliver the requirements of the European Water Framework Directive. It aims to avoid deterioration and improve, where necessary, the ecological quality of rivers, lochs, estuaries, coastal and ground waters.

River basin planning will be delivered in Scotland by a network of Area Advisory Groups (AAG), overseen and coordinated by a National Advisory Group. Each AAG will be responsible for producing Area Management Plans which will form the 'geographic chapters' of the RBMP for the River Basin District. Loch Fyne is part of the Argyll AAG area

As part of the River Basin Planning process, Scottish waters are required to be classified in accordance with their ecological status. The current draft classification results for Loch Fyne have identified the loch as having 'Good' status. Although the coastal water bodies of Loch Fyne are currently 'Good' status, it is important that there is no deterioration of these water bodies.

Whilst activities such as point-source pollution, water abstraction, storage and flow regulation are regulated under the Controlled Activities Regulations (CAR), there are some pressures that are not subject to regulation e.g. diffuse pollution, historical changes to the physical form of a water body and non-native invasive plants and animals. Actions to tackle these problems using non-regulatory methods are being developed with the expertise and support of the Argyll AAG.

Argyll and Bute Development Plan (Structure & Local Plan)

The following Local Plan policies have been developed in consultation with SEPA in order to minimise the impact of development upon water resources and the marine environment. More information on these policies can be found in Appendix I.

Policy LP SERV 1 – Private Sewage Treatment Plans and Wastewater (i.e. drainage) Systems.

Policy LP SERV 2 – Incorporation of Natural Features/Sustainable Drainage Systems (SuDS)

Policy LP SERV 3 – Drainage Impact Assessment (DIA)

Policy LP SERV 5 – Waste Related Development and Waste Management in Developments

Policy LP ENV 12 – Water Quality and Environment

Policy ENV 1 – Development Impact on the General Environment

Scottish Water Asset Improvement

Scottish Water's investment programme is planned in advance and includes upgrades to sewage works and public drinking water supply infrastructure. The planning of the investment programme is an on-going process undertaken in consultation with the wider public, which is known as Quality and Standards. Many of the actions undertaken under Q and S will help to achieve improvements in water bodies which are currently failing the Water Framework Directive.

2.7.3 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Water Quality – **Recommendations 10, 13, 39; Good Practice 4 & 10.**

2.8 Climate Change

Due to the considerable maritime influences in Scotland, it is inevitable that changes in the seas caused by climate change will have environmental and socio-economic impacts on Scotland. Therefore, there is a need to improve confidence in both understanding what is happening and in predicting the likely consequences of climate change within Scottish waters.

2.8.1 What are the risks to Loch Fyne and its surrounding coast?

The main potential effects from climate change on the human use of Loch Fyne and its surrounding coast is summarised in Table 2.2. Data has been taken from the Marine Climate Change Impacts Partnership Annual Report Card 2007-2008 (see www.mccip.org.uk) and Scotland's Seas: Towards Understanding their State (Baxter *et al.* 2008).

Table 2.2 Potential future effects of climate change on the commercial use of Loch Fyne

POTENTIAL EFFECTS	
Coastal flooding	Increased flood risk from both rivers and the sea. Further rises in sea level over the next 100 years will tend to increase the frequency of extreme high-water-level events. The SEPA Flood Risk Map identifies several areas of coast that are at risk of flooding from rivers and the sea including short stretches of the A83, B8000 and A886. These areas are estimated to have a 1 in 200 or greater chance of being flooded in any given year, which may increase in the future.
Built structures	Increased wave heights, sea-level rise and increased rates of erosion could increase damage to coastal structures. Allowances for annual rates of sea-level rise are made in the planning of coastal structures.
Aquaculture	<p>In the short term, climate change is unlikely to have a significant effect on UK-farmed marine fish.</p> <p>Rising water temperatures could increase growth rates for some species (e.g. Atlantic salmon, mussels and oysters), but may also cause thermal stress for cold-water species (e.g. cod and Atlantic halibut) and intertidal shellfish (e.g. oysters).</p> <p>Farmed species may become more susceptible to a wider variety of diseases as temperatures increase.</p> <p>Increasing harmful algal and jellyfish blooms may lead to additional fish kills and closure of some shellfish production areas.</p> <p>Increased temperatures and more abundant plankton could also improve reproduction and settlement of 'spat' at shellfish farms.</p>
Fisheries	<p>Distribution shifts and modifications of fish behaviour as a result of temperature changes may affect the vulnerability of certain fish stocks to fishing fleets.</p> <p>Long-term climate change may affect the overall productivity of fish stocks in a given area. Some species may be adversely affected leading to reductions in sustainable yield, whilst others, for example sea bass, red mullet and John Dory, may be positively affected leading to enhanced fishing opportunities.</p>

2.8.2 Recommendations

The following 'Recommendations for Future Management, Use and Development', outlined in Section 3.12 are relevant to Climate Change – **Recommendations 11 & 37.**

3 Current Activities

Within Loch Fyne a diverse range of activities occur such as aquaculture, commercial and recreational fishing, scuba diving, sailing, charter boat operations and tourism. All of these activities depend to some degree on the health of the coastal and marine ecosystem, whilst other activities e.g. walking, rely more on the physical characteristics of the loch or the surrounding scenery. Therefore, all activities and their interaction with other interests need to be considered in an ICZM plan.

This section provides an overview of the current status of all the major activities and interests within the loch, including information on economics, potential impacts, potential conflicts with other activities, existing management measures and required consents where appropriate. There are a wide range of regulatory authorities responsible for the management and licensing of marine and coastal activities. A summary on the roles and responsibilities of these regulators can be found in Appendix IV.

Throughout the process of developing this plan, local issues have been identified through the Loch Fyne ICZM Group and, where possible, local management agreements have been implemented to address these issues. These agreements are compiled at the end of this section together with recommendations on future management, use and development and current best practice when operating within marine and coastal waters.

3.1 Finfish Aquaculture

Finfish farming in Loch Fyne began in the 1970s and is an important component of the local economy providing employment in the local towns and villages. Downstream jobs are also supported in transport, processing and support services.

Currently only Atlantic salmon are farmed within the loch, but there is a hatchery for halibut and cod at Largiemore where brood stock is used to produce larvae that are grown on and then sold to farms to grow on to adult size. There are also salmon smolt production facilities at Cairndow and Furnace.

3.1.1 Existing Operators & Development

The only operator in Loch Fyne is Lighthouse Caledonia, who was formed in 2007 by the integration of the former companies Pan Fish Scotland and Fjord Seafood Scotland. Marine production takes place at 41 sites in Argyll & Bute, Skye, Wester Ross, Sutherland, Arran and the Western Isles.

Since a recent consolidation in 2007, Lighthouse Caledonia now has 10 sites in Loch Fyne for the on-growing of Atlantic salmon. These sites are operated in conjunction with other farms in the Kyles of Bute and produce a significant proportion of the company's annual production.

To service the marine farms, shore-bases are located at Cairndow, Crarae and Strondoir Bay, and at Portavadie, there is a portable harvesting station. The company's primary processing plant for Argyll is located at Cairndow, processing 16,000 tonnes annually. Maintenance and recycling of cages also occurs at Cairndow.

3.1.2 Economics

Finfish farms in Argyll produced 19% of farmed salmon in Scotland in 1999 (MacKay Consultants 2001). Lighthouse Caledonia is the largest fish farm company in Argyll and Bute and their Loch Fyne sites currently produce approximately half of the company's annual output. MacKay Consultants (2001) estimated that in 2000 the annual production of 6,500 tonnes in Loch Fyne was worth £25 million once the fish had been processed and the contribution to the local economic output as GDP was £12.7million.

Lighthouse Caledonia is one of the largest private employers in the local area, employing their staff year round. They therefore play an important role in the socio-economics of the area, where many people are employed on a seasonal or part-time basis. The company provides employment for approximately 25 sea site staff and 60 processing and administration staff at Cairndow.

3.1.3 Potential Impacts of Finfish Farming

There are a range of potential effects from finfish development which can include impacts on the following:

- Visual amenity – potential effects on landscape character, scenic quality and visual amenity;
- Historic environment – potential effects on the setting of known coastal historic features and direct offshore impacts on shipwrecks;
- Water quality – potential effects from release of nutrients, occasional medicines and antifoulants;
- Benthic impacts – accumulation of solid wastes on the seabed;
- Wildfish populations – farmed salmon can affect wild salmonids through the transfer of disease and parasites, and effects from escapes of interbreeding and competition;
- Marine wildlife – potential for the operation of the site to disturb marine mammals and seabirds and interaction with predators;
- Navigation – potential to create hazards to navigation;
- Other users – potential to compete for space with other sectors e.g. commercial fisheries and recreational anchoring;

- Existing aquaculture sites – potential effects on the management of disease and parasites, and
- Noise pollution – potential to be a source of noise pollution due to activities associated with the construction and operation of the facility.

As an industry, finfish farming is heavily regulated and regulatory and statutory advisers generally perceive these potential impacts as being managed through existing consents procedures and existing management controls. In many cases, the potential for conflict can be significantly minimised through: siting development in appropriate locations and at an appropriate scale; appropriate mitigation measures, and the adherence to codes of good practice and management agreements.

3.1.4 Existing Management and Controls

There is wide range of legislation, national policy and guidance that is relevant to the regulation and operation of finfish aquaculture in Scotland, which has been summarised in Appendix V. The existing management and controls that are specifically relevant to the operation of finfish farms in Loch Fyne are discussed below.

Locational Guidelines for the Authorisation of Marine Fish Farms in Scottish Waters

Loch Fyne is listed under the Scottish Government's Locational Guidelines for the Authorisation of Marine Fish Farms in Scottish Waters as a Category 3 area. Areas are designated based on predictive modelling of nutrient enhancement and benthic impact conducted by the Fisheries Research Services. Category 3 areas are the least sensitive and show the lowest potential for environmental impact. Therefore, they offer the best prospects for obtaining permission for aquaculture development, although each case is still considered carefully and site-specific modelling is run for each application.

Code of Good Practice for Scottish Finfish Aquaculture

Lighthouse Caledonia adheres to the Code of Good Practice for Scottish Finfish Aquaculture. This was established to ensure all farmers adhere to relevant legislation; manage their sites in an economically, socially and environmentally sustainable way; meet specified standards, e.g. in stock health and welfare; provide assurance to other interest groups on fish farming practices; and provide an alternative to further regulation of the industry.

Aquaculture and Fisheries (Scotland) Act 2007

This Act makes provision in relation to finfish farms for sea lice control and containment of fish. It gives Marine Scotland inspectors powers to inspect fish farms to ensure that satisfactory measures are in place to control sea lice, to contain farmed fish, prevent escapes and recover escaped fish.

Area Management Agreements

The Scottish Government established the Tripartite Working Group (TWG)⁵ in 1999 to address problems common to salmon farming and wild salmon fisheries, and seek solutions for ensuring the maintenance of a healthy stock of wild fish whilst at the same time promoting a sustainable aquaculture industry (Tripartite Working Group 2009).

In Scotland, local Area Management Groups (AMGs) have been established, composed of representatives from local fish farming companies and local wild salmonid interests, with a goal to promote and maintain the good health of wild and farmed salmonids through an Area Management Agreement (AMA). The main objective of an AMA is to incorporate measures to promote both wild and farmed fish health, of which include:

1. Synchronised Production, ensuring all sites within the AMA are on the same production cycle and thus allowing at least a six week fallow period and coordinated treatment regime;
2. No ovigerous (egg bearing) lice on farmed fish between February and June during the smolt run;

⁵ Further information - <http://www.tripartiteworkinggroup.com>

3. Development of site specific containment plans and contingency plans for re-capture of escapee fish;
4. Relocation of farm sites in sensitive areas;
5. Promotion of catch and release policies;
6. Restoration of degraded river systems;
7. Protection against *gyrodactylus salaries*, and
8. Promotion of wild fishery restoration plans (Argyll Fisheries trust 2009)⁶.

An AMA for Loch Fyne was originally set up in 2001 and was one of the first areas established in Scotland. Loch Fyne is now managed as part of the Firth of Clyde AMA⁷ which encompasses both the Kyles of Bute and Loch Fyne regions, operating as one large management area.

In 2006, Lighthouse Caledonia consolidated their operations in Loch Fyne. The consolidation proposals were agreed through the Clyde AMG and resulted in the cessation of farming at three sites near the head of the loch which were closest to the mouths of the Rivers Fyne, Aray and Douglas, while production was increased at appropriate existing sites elsewhere in the loch. Lighthouse Caledonia is now in the process of relinquishing its Crown Estate leases for the vacated sites.

It is recognised that having a single salmon farm operator in this management area has been of benefit to the work of the Firth of Clyde AMG who are continuing to see improvements as a result of this consolidation. A new production strategy in 2007 has allowed a significantly greater fallowing period of four months in Loch Fyne and six to eight weeks in the Kyles of Bute. This is likely to increase long-term benefits to wild fish within the management area.

Predator Control

Predator control is undertaken in the first instance by using carefully weighted and tensioned nets. This system is regarded as being industry best practice and together with improved fish health reduces the initial attraction for predators. Acoustic Deterrent Devices (ADDs) are only used on sites where the requirement for deterring seals has been determined and the device is only triggered when fish jump out of water as if evading a predator. Top nets are also put in place throughout production cycle to prevent predation from birds.

3.1.5 Other Finfish Species

Cod Farming

Although the industry is still new and much is still to be learned about the environmental impacts, the farming of cod shows potential for future expansion in Argyll. Research is currently being conducted into cod diseases and viruses, and cod do require to be vaccinated against the common disease, vibriosis. Organic cod may offer further market potential, however the cost of growing fewer fish to meet organic welfare standards may not be economically viable at this time. The success of Shetland-based Johnson Seafarm's "No Catch" organic farmed cod was short lived, with the company going into administration after three years.

Halibut Farming

Halibut, which was once considered to be by-catch, is now a premium product with fishmongers and a popular choice of restaurants and the public. However, due to low stock levels, wild halibut is now considered an unsustainable species by the Marine Conservation Society with farmed halibut recommended as a sustainable alternative.

Halibut have been farmed in Argyll since 1999 by Kames Ltd. at Kilmelford. Currently Otter Ferry Seafish, based in Loch Fyne, is the only halibut hatchery in Scotland that produces young fish. Therefore, with this local resource, there is potential to develop the industry in Argyll.

⁶ <http://www.argyllfisheriestrust.co.uk/>

⁷ <http://www.tripartiteworkinggroup.com/content.asp?ArticleCode=51>

Halibut rearing is suited to the climate of the west coast of Scotland, and as there are negligible stocks of halibut on this coast, the risks of genetic pollution are thought to be low. Additionally, the requirement for areas with more gentle water currents mean that some inappropriately located salmon sites in sheltered sea lochs may be suitable for conversion.

3.1.6 Required Consents for Finfish Development

Aquaculture developments are subject to a range of complex regulatory and consenting procedures.

Required Consents	Regulator	Details
Seabed Lease	The Crown Estate	Where the foreshore/seabed is owned by The Crown Estate an operator must apply for a lease for the right to occupy the site.
Planning Permission	Argyll and Bute Council	Applications for new or modifications to existing marine fish farms are made to the relevant planning authority.
CAR Authorisation	Scottish Environment Protection Agency (SEPA)	SEPA regulate discharges through the Water Environment (Controlled Activities) Regulations 2005 by issuing CAR authorisations and monitor authorised discharges.
Coast Protection Act 1949 - Section 34 Consent	Scottish Government, Ports and Harbours Division	Section 34 consent is required for the installation of any new farm or modification of an existing farm. The purpose of control under Section 34 is solely concerned with the safety of navigation.

Further information on the procedure for applying for planning permission for a new finfish farm or modification of an existing farm can be found in Appendix VI.

3.1.8 Future Development

Section 5 of the plan assesses the potential for new finfish development or expansion of existing sites across different areas of Loch Fyne and any identified opportunities for development are summarised in Section 6.

In the future Lighthouse Caledonia plan to:

- Implement the ISO 14001 Environmental Management System company-wide.
- Harvest salmon from all sites using a wellboat.
- Explore the opportunity of a pump-a-shore harvesting system at Cairndow.

Undeveloped sites

There is concern nationally about the number of finfish and shellfish sites that have a Crown Estate seabed lease, but have not been developed. Undeveloped sites can inhibit future development as they have to be treated as if they were fully developed when identifying the potential for new sites. It is noted that some of these sites may no longer be economically viable to operate and in some situations owners of the lease may be reluctant to give up a lease as it is seen as an asset. Argyll and Bute Council is supportive of unused leases either being developed or relinquished in order to give others the opportunity to use these sites. Undeveloped sites do not appear to be an issue in Loch Fyne at present.

Interaction with wild migratory salmonids

In relation to the operation of Loch Fyne as a single management unit for finfish farming, Lighthouse Caledonia would be significantly concerned if a new operator wished to develop in this zone. While this plan does not discourage new finfish operators from applying for new finfish sites in Loch Fyne, it does actively encourage operators to discuss new development proposals in detail with the Clyde AMG and wild fish interests, prior to submitting a planning application. New applications would need to demonstrate that it would be possible to operate any new site to the same standards as are currently in place and that the existing aims and objectives of the AMA could be maintained.

Considering the risk to wild fish in isolation, the head of Loch Fyne (Policy Zones J & K) is identified by wild fish interests as the most sensitive part of the Loch, followed by the middle of the loch (policy zones F, G, H, I, L, M & N) which is considered highly sensitive. Lower Loch Fyne (policy zones A, B, C, D, O, P & Q) is identified as the least sensitive and therefore reducing development in the middle of the loch in favour of development in the lower loch would be the best management option for wild fish concerns. While Argyll and Bute Council recognise these sensitivities, the policies for aquaculture development, detailed in Section 5 of the plan have to take account of all sensitivities and the potential for increased development in certain parts of lower Loch Fyne is unfortunately constrained by landscape sensitivities and the existing level of development.

3.1.9 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Finfish Aquaculture – ***Recommendations 1 – 5, 7, 14, 16, 17, 32, 34, 35, 37; Good Practice 1, 2, 6.***

3.2 Shellfish Aquaculture

Shellfish farming began in Loch Fyne in 1977 and is an important component of the local economy providing employment in the local towns and villages. Downstream jobs are also supported in transport, processing and support services. Mussels (*Mytilus edulis*), king (*Pecten maximus*) and queen scallops (*Aequipecten opercularis*), and oysters (*Crassostrea gigas*) are all currently farmed in Loch Fyne.

3.2.1 Existing Operators & Development

Loch Fyne Seafarms were set up in 1987 with the aim of producing scallops on the west coast of Scotland. They currently farm scallops and oysters from five sites in the southern end of the loch and have a shoreline plant in Tarbert which ensures that harvesting, transportation and processing times are minimised to optimise the quality of the final product. Loch Fyne Seafarms also have a storage facility near Stonefield Castle. They produce 3 million queen scallops annually which equates to approximately 100 tonnes per year.

Set up in 1978, Loch Fyne Oysters Ltd. is based at Cairndow at the head of Loch Fyne and farm oysters and mussels at Ardkinglas. The Ardkinglas oyster farm has grown into the largest producer of oysters in the UK, around 750,000 shells per annum, with the mussel farm producing 90-100 tonnes per annum. These farms are supplemented with depuration facilities, where shellfish from Ardkinglas and other farms outside Loch Fyne are processed for distribution, a smokehouse producing a range of smoked salmon, an oyster bar, restaurant and shop, and a nationwide mail order service. In addition, a trade department supplies a wide range of products to restaurants, hotels, delicatessens and fishmongers throughout the UK and to over 22 countries worldwide. A sister company, Loch Fyne Restaurants, which is composed of 29 restaurants, is supplied with Loch Fyne Oysters products.

3.2.2 Economics

Loch Fyne Seafarms Ltd. employed just two people in 1987, but this has increased steadily over time, with more people being employed after the opening of their processing factory in 1991, reaching a total of 20 employees by 2005.

Loch Fyne Oysters achieve an annual turnover of around £10 million per year from their smokehouse, farms, shop and restaurant. They employ 109 people at Cairndow (DTZ Pida Consulting 2005), which is a significant proportion of people living in the upper reaches of the loch. They also employ around 20 seasonal employees, 10 during the summer for the restaurant and shop and 10 as pre-Christmas processing staff. The full-time equivalent employees have an annual income of £1,984,000 (DTZ Pida Consulting 2005). The business also relies on external suppliers and companies, spending £2.372 million locally with suppliers in the West of Scotland in 2003 (DTZ Pida Consulting 2005).

3.2.3 Potential Impacts

There are a range of potential effects from shellfish aquaculture which can include impacts on the following:

- Visual amenity – potential effects on landscape character, scenic quality and visual amenity;
- Historic environment – potential effects on the setting of known coastal historic features and direct offshore impacts on shipwrecks
- Benthic impacts – during grading mussel debris can accumulate on the seabed, with potential impacts on benthic habitats particularly sensitive to smothering and can attract predatory species such as starfish;
- Native biodiversity – non-native species can be introduced through the importation or translocation of shellfish stocks;
- Navigation – potential to create hazards to navigation;
- Other users – potential to compete for space with other activities such as commercial fisheries and recreational interests; and

- Noise pollution – potential to be a source of noise pollution due to activities associated with the construction and operation of the facility.

In many cases the potential for conflict can be significantly minimised through siting development in appropriate locations at an appropriate scale and through appropriate mitigation measures, and the adherence to codes of good practice. It could be argued that shellfish farming may have some benefits to wild shellfish stocks e.g. farmed scallops release their fertilised eggs into the open water which may contribute to wild populations.

3.2.4 Water Quality for Shellfish Growing

Bivalve molluscs such as mussels, scallops and oysters feed by filtering phytoplankton from the water and therefore pristine waters are essential for growing shellfish. Due to their filter feeding nature, shellfish will take up algal toxins, pathogens such as *Escherichia coli* (*E.coli*) and other pollutants, which can accumulate in high levels in the tissue, making it unsuitable for human consumption. When considering the siting of new shellfish farms, it is important that developments are not close to any significant effluent discharges. Designated shellfish waters can also be affected by bacterial contamination from livestock inputs, particularly at times of heavy rainfall.

The following designations aim to protect water quality for shellfish growing and the quality of shellfish products for human consumption. The location of these designations is presented in Figure 3.1.

Shellfish Production Areas

Shellfish Production Areas are designated under the EC Shellfish Hygiene Directive 91/492/EEC, and require monitoring to ensure that shellfish are fit for human consumption. These areas are classified by the Food Standards Agency Scotland on the basis of *E. coli* concentrations, from A to C according to the degree of contamination in samples of mollusc flesh. The regulations also states the degree of depuration treatment required before the produce can be marketed if the production area is classified as B or C.

Loch Fyne has very clean waters and is a category A for most species for the majority of the year. Further information can be found on the Food Standards Agency website <http://www.food.gov.uk/scotland/safetyhygienescot/shellmonitorscot/shellclassesscot/>. Note that the production area at Skipness is designated for the commercial harvesting of wild razor shells, rather than the farming of shellfish.

Shellfish Growing Waters

Shellfish Growing Waters are designated under the EC Shellfish Waters Directive (2006/113 EC), which sets physical, chemical and microbiological water quality standards. This designation should contribute to improving and maintaining the quality of the shellfish that are harvested from these waters, protect the health of the people who consume them and thereby also assist the shellfish growing industry. Designation may also provide additional environmental benefits to local flora and fauna and other marine life, from cleaner water at these sites.

Current SEPA Policy seeks to direct all new discharges of sewage effluent into soakaway arrangements in an attempt to avoid direct discharges to designated areas, such as Shellfish Growing Waters wherever possible. Where such discharges are unavoidable, consent conditions will be set to ensure the discharge is subject to treatment by any process and/or disposal system, thereby allowing the receiving waters to meet the relevant quality objectives and the relevant provisions of these Directives.

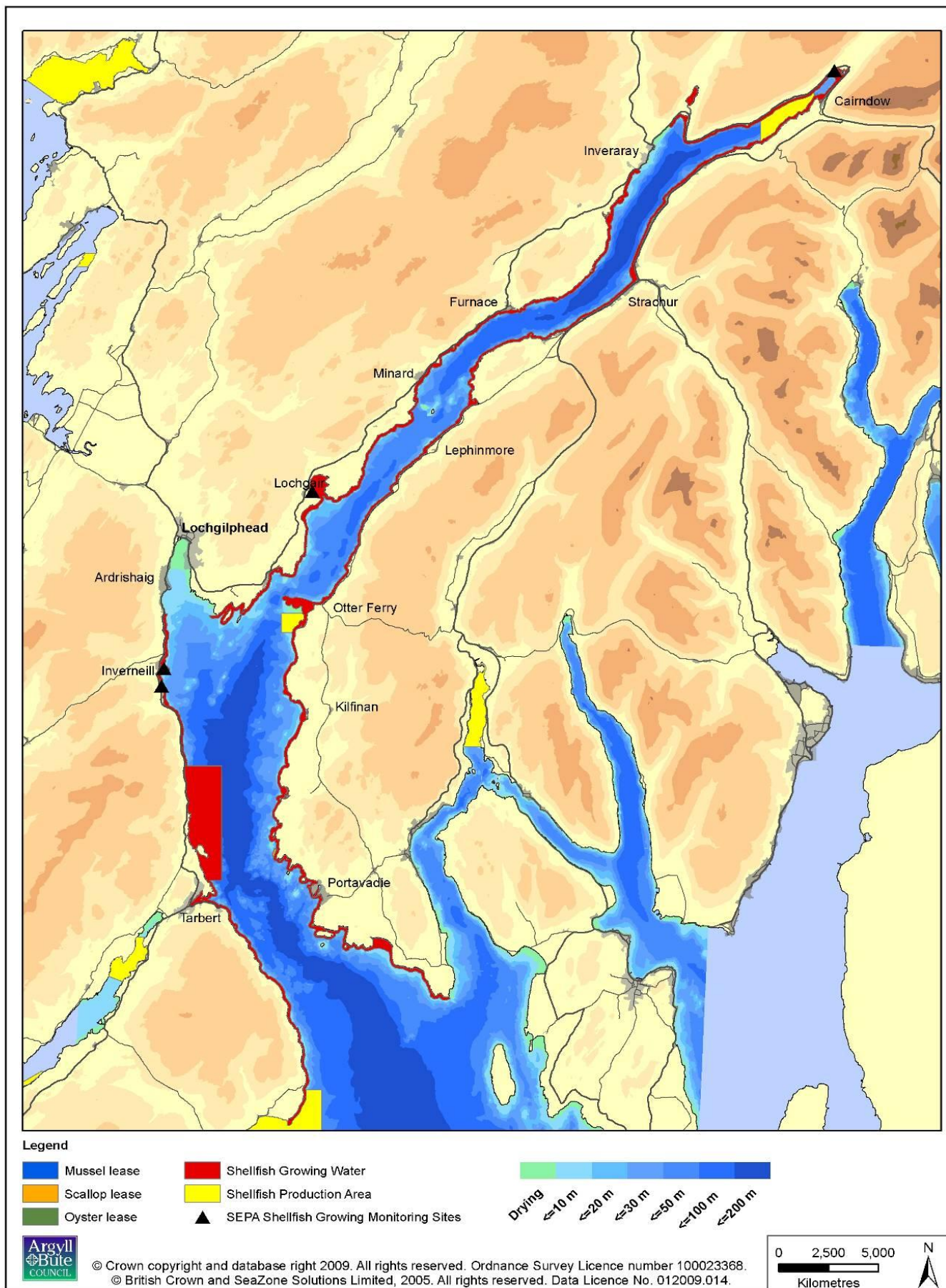


Figure 3.1 Location of Shellfish Leases, Growing Waters and Production Areas

3.2.5 Existing Management and Controls

There is a wide range of legislation, national policy and guidance that is relevant to the regulation and operation of shellfish aquaculture in Scotland, which has been summarised in Appendix V. Existing management specifically relevant to the operation of shellfish farms in Loch Fyne is discussed below.

Association of Scottish Shellfish Growers (ASSG) Code of Good Practice

The majority of shellfish farmers in Loch Fyne adhere to the ASSG Code of Good Practice (<http://www.assg.co.uk/index.html>) which aims to ensure that 'activities are managed in an environmentally responsible and sustainable manner that is in harmony with the needs of other marine and shoreline users.' It covers establishing and locating a shellfish farm, environmental impacts, monitoring, husbandry, use of equipment and materials, waste management, health and safety, training and depuration.

Predator Control

The main predator of farmed oysters in Loch Fyne is the oyster catcher which is responsible for about 5% loss annually for Loch Fyne Oysters. For mussels, the main predator is the eider duck. These predators are controlled by having a presence on the water.

3.2.6 Required consents for shellfish development

Aquaculture developments are subject to a range of complex regulatory and consenting procedures.

Required consents	Regulator	Details
Seabed Lease	The Crown Estate	Where the foreshore/seabed is owned by The Crown Estate, an operator must apply for a lease for the right to occupy the site.
Planning Permission	Argyll and Bute Council	Applications for new or modifications to existing marine fish farms are made to the relevant planning authority.
Coast Protection Act 1949 - Section 34 Consent	Scottish Government, Ports and Harbours Division	Section 34 consent is required for the installation of any new farm or modification of an existing farm. The purpose of control under Section 34 is solely concerned with the safety of navigation.

Further information on the procedure for applying for planning permission for a new shellfish farm or modification of an existing farm can be found in Appendix VI.

3.2.7 Future Development

In future, Loch Fyne Seafarms Ltd. wishes to: expand into new sites; look at developing integrated aquaculture (e.g. shellfish and algae grown together), and develop hatcheries for King scallops, with associated genetic work on selection for growth, yield and immunity to algal toxins.

The reintroduction of the native oyster by extensive farming of loose laid individuals has been identified as a possible opportunity for the head of Loch Fyne, north of Dunderave Point. There may also be potential in certain parts of the loch for scallop ranching, whereby scallops are seeded in an area enclosed by approximately 1 m high nets held in place by stakes. These are then left to grow before being harvested. The ranching of native oysters or scallops would only be viable if the operator had a Several Order, which restricts the public right to fish in a defined area. This is discussed further in section 6.3.3.

3.2.8 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Shellfish Aquaculture – **Recommendations 1, 2, 5, 7, 10, 14 - 16, 25, 37, 39; Good Practice 1, 2, 5, 6.**

3.3 Commercial Fishing

The local fleet, once reliant on herring and whitefish, now targets shellfish species using a variety of fishing methods. The main target species are *Nephrops norvegicus* (otherwise known as prawns, langoustine or scampi), which are taken by trawling and creeling, and scallops, which are taken by dredging and diving. Trawlers operate in the majority of the loch, apart from the shallow fringes and around the area of Otter Spit. Two of the trawlers registered in Tarbert swap to scallop dredging at certain times of the year and fish within the loch. Creeling for *Nephrops* occurs in similar areas to those for trawling and in several bays in the lower loch. Creeling also targets crab and lobster. There are also several vessels operating within the loch with divers targeting razor fish and scallops and no doubt a number of other local divers who collect scallops in the loch from time to time.

The fishery region of Loch Fyne falls within the West of Scotland Fishery District, and the ICES fishing area VIa. The main fishing harbour in Loch Fyne is Tarbert, with a few vessels also registered at Ardrishaig and Inveraray. Landings occur at Tarbert and Ardrishaig and the port of Carradale is also associated with Loch Fyne.

Commercial fishing occurs widely across the marine waters of Loch Fyne and Figure 3.3 provides a snapshot of approximate areas used for different methods of commercial fishing at the time of plan preparation. It is important to note that these areas will be subject to change over time and will expand and retract in response to species distribution and, and to a lesser extent, technical innovation and change. In addition, many of these areas are fished when weather conditions prevent safe fishing in other areas, or are fished only at certain times of the year, when the target species is in abundance.

3.3.1 Economics

There has been a continuing trend in declining numbers of fishermen employed in the Scottish fishing industry since 1938, with a decline of 26% between 1996 and 2006 (Wilson 2008). No specific employment figures are available for Loch Fyne.

According to data supplied by the Sea Fisheries Marine Directorate of the Scottish Government for Tarbert, both the value and live weight of total fish landings (fish & shellfish) have increased over the period 1998 to 2007. However, combining data for Tarbert with Ardrishaig and Carradale landing creeks, a different trend in fish landings is seen, with a decrease in the total amount of fish landings of 23%, but an increase in the value of total fish landings by 30% (Wilson 2008).

Table 3.1 Fish landings (fish & shellfish) by volume and value for Tarbert, Loch Fyne.

Year	Volume (Tonnes)	Value (£)
1998	772	2,015,485
1999	691	1,964,148
2000	640	1,347,949
2001	718	1,733,993
2002	796	1,979,602
2003	875	2,000,219
2004	665	1,448,126
2005	872	1,889,897
2006	715	1,990,976
2007	952	2,690,249
Change from 1998 to 2007	+180 +23%	+674,764 +33%

Separating out the data for shellfish and fish, it becomes apparent that there has been an increase in the amount of shellfish being landed and a considerable decrease in the amount of pelagic and demersal fish being landed over the period 1998 to 2007 (Wilson 2008).

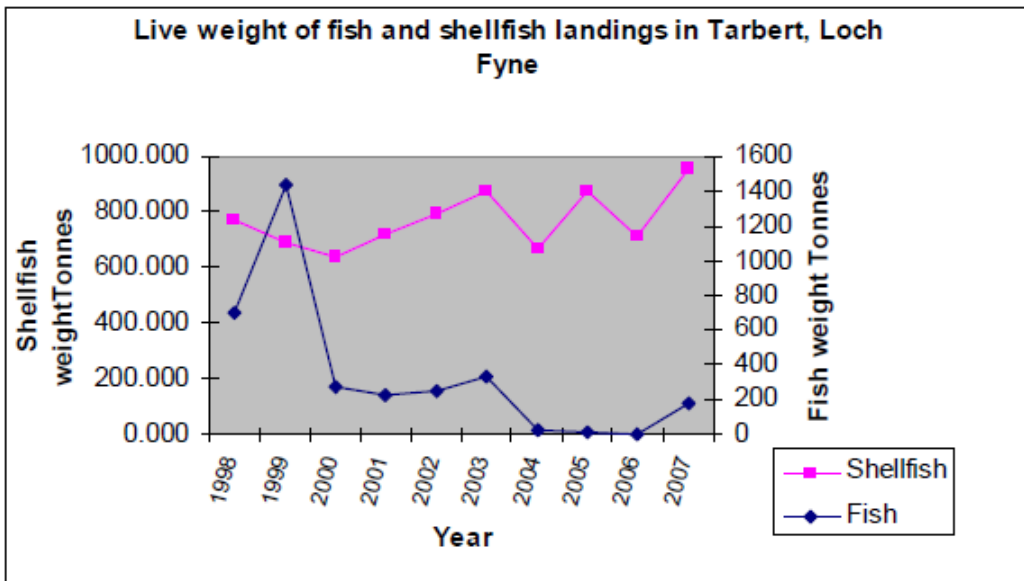


Figure 3.2 Live weight fish and shellfish landings for Tarbert, Loch Fyne

3.3.2 Potential Impacts and Conflicts

Potential Impacts

- Marine Habitats and Species – maerl beds, file shell beds, eel grass and the fireworks anemone (see section 2.3.3) are particularly sensitive to physical disturbance.
- Historic environment – trawling and dredging have the potential to affect ship wrecks, however this is not felt to be an issue in Loch Fyne with no designated wrecks at present. It should also be noted that it is not in the interest of fishing vessels to fish over or in close vicinity of wrecks due to the risk of entanglement and gear damage.

There is significant concern by some Community Councils and wild fish interests about the potential effects of trawling in Loch Fyne, particularly upper Loch Fyne. There is a perception that trawling has damaged seabed habitats, affecting the productivity of this area and is preventing the recovery of local fish stocks that are of importance to recreational anglers.

The effects of fishing on the marine environment are not fully understood and a marine management project in the Firth of Clyde has identified that there is a lack of scientific data to determine the impacts of fishing on the marine environment. The draft Firth of Clyde Marine Spatial plan⁸ (FoCMSP) identifies a proposal for a wide ranging investigation and evaluation of the impacts from all types fishing activity, in order to underpin future sustainable management within the region. Further information on fishing in the wider Clyde sea area can be found in the Clyde Environment and Fisheries Review (Combes & Lart 2007), which discusses the potential environmental effects of fishing practices in the Clyde in relation to seabed habitats, target species and bycatch.

Conflicts

Conflict between static and mobile gear vessels has been a problem in the loch in the past, with several complaints being lodged with Strathclyde Police. As a result these conflicts have been reduced, but are still an issue.

⁸ Firth of Clyde Marine Spatial Plan (www.clydeforum.org/SSMEI)

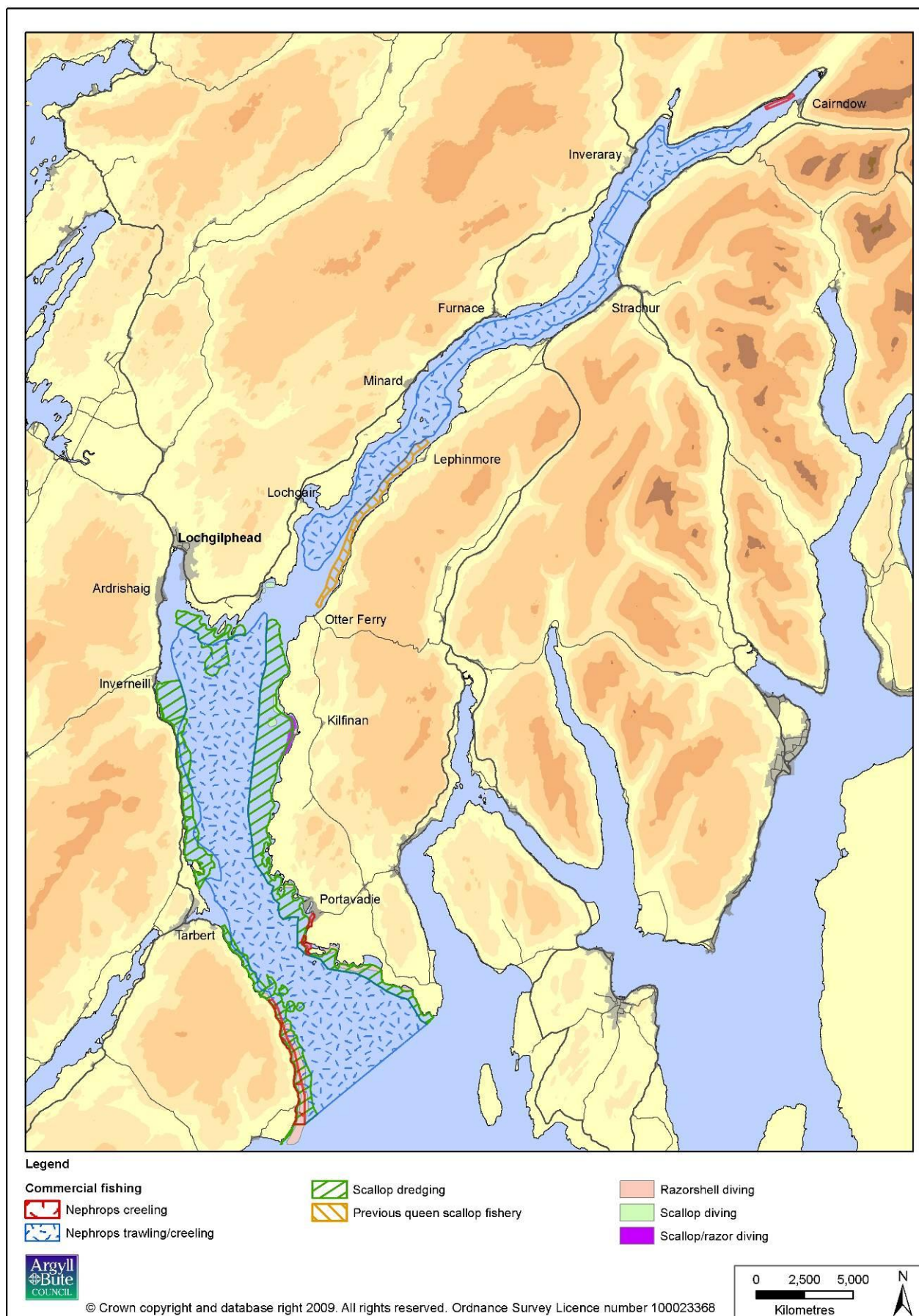


Figure 3.3 Location of fishing activity in Loch Fyne

New developments such as finfish or shellfish farms, marine renewable devices, or moorings have the potential to restrict access to existing fishing grounds. Although some developments may involve relatively small areas of seabed the restriction of mobile gear fishing in particular, can be well beyond its location and the cumulative effect of many developments can be considerable.

There is also a need for ongoing investment in maintaining facilities such as ports, piers and jetties and access to these facilities has been identified as important to the industry.

Other local issues are discussed in section 3.11.

3.3.3 Existing Management and Controls

Weekend Mobile Gear Ban

Loch Fyne waters are shared by all vessels, but there is a weekend ban on mobile gear fishing. No form of mobile fishing is permitted in the Firth of Clyde (including Loch Fyne) between the hours of midnight on Friday and midnight on Sunday. The present prohibition, which was introduced in 1986, is a continuation of earlier prohibitions both statutory and voluntary, and was introduced at the request of the Clyde Fishermen's Association (CFA).

Clyde Fisheries Development Project

Loch Fyne comes under the Clyde Fisheries Development Project⁹ which aims to develop a cross-sector partnership to ensure a sustainable future for Clyde inshore fisheries and has produced two reports – *Clyde Environment & Fisheries Review* and *Sustainable Supply Chain Project*.

Inshore Fisheries Groups

On a Scottish scale, the management of inshore fisheries is undergoing significant change with the development of Inshore Fisheries Groups (IFGs). IFGs will be assigned areas around the coast of Scotland and commercial fishermen from all sectors will be involved in the development of local management plans and decision-making. IFGs will also allow stakeholders to contribute towards the development of inshore fishery management policy and take into account local conditions and needs. An IFG for the Firth of Clyde (including Loch Fyne) was established in 2009 and further information on the work of this group can be found at <http://www.scotland.gov.uk/Topics/Fisheries/Sea-Fisheries/InshoreFisheries/IFGsMap/ClydeIFG>.

Voluntary agreement – Upper Loch Fyne

Populations of the rare *Pachycerianthus multiplicatus* anemone identified by 'Seasearch' surveys (2005 and 2006) in Loch Shira have potential to be damaged by trawling activities. A voluntary agreement was reached with the Clyde Fishermen's Association, not to trawl shallower than 20m in order to protect the anemones.

There is also an agreement between Argyll Fisheries Trust and Clyde Fishermen's Association not to trawl in waters shallower than 50m at the head of the loch, north of Dunderave Point.

3.3.4 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Commercial Fishing – **Recommendations 2, 5, 6, 8, 18 - 23, 33, 37; Good Practice 1 & 2.**

It should be noted that these recommendations have not been discussed by or approved by the newly established Clyde Inshore Fisheries Group.

⁹ www.gla.ac.uk/marination/CFPD/index.htm

3.4 Recreational Activities

There are a wide range of recreational activities occurring within the loch and along its shores such as walking, angling, sailing, boating and scuba diving. Several local businesses are orientated around these activities and they are important to the wellbeing of those living by and visiting the loch. The location of all recreational activities and infrastructure is presented in the maps for each individual policy zone in Section 5 of the plan.

3.4.1 Coastal Walks, Viewpoints and Picnic Areas

There are a variety of paths around the shores of Loch Fyne and in the neighbouring hills offering opportunities for walkers, cyclists, mountain bikers and horse riders. Many of these paths provide impressive views of Loch Fyne, in addition to picnic areas and interpretation, as well as opportunities to view local wildlife. The majority of paths are found on the western side of Loch Fyne in Forestry Commission land and are accessible to the towns and villages along the coastline.

Core paths

Argyll and Bute Council are currently developing a Core Path Plan, as required under the Land Reform (Scotland) Act 2003. This plan will detail the basic network of paths in Argyll and Bute that are important to local people and visitors for recreation and everyday journeys. Core path networks will provide opportunities for walking, cycling, riding, and other activities for people of all ages and abilities.

3.4.2 Scuba Diving

Loch Fyne offers sheltered waters with generally good visibility where diving is possible all year round. There are at least 45 identified dives sites, offering a choice of intact wrecks, pinnacles, wall and drop-offs, many of which are promoted by dive guides such as 'Dive West Scotland', dive club websites and local businesses. Some of these dive sites are very popular and are frequently busy at weekends due to the proximity of Loch Fyne to the central belt of Scotland. However, land access to some dive sites remains an issue.

Loch Fyne Dive Charters operates out of Tarbert, providing a dive charter vessel for hire by groups of scuba divers and equipment/tank refills. Loch Fyne Services, also operating out of Tarbert, offer hire of their vessel for commercial dive charters and by special arrangement for use by sports divers. Argyll Caravan Park provides tank refills in the summer months. There are several places to launch dive boats along the loch including Tarbert, Strachur Bay, Lachlan Bay, Minard and Port Ann.

Some of the most spectacular diving can be found at the south end of Fraoch Eilean, (Minard Narrows) and between Kenmore Point and Pennymore Point (opposite Strachur) where there are several stretches of near vertical cliffs supporting colourful, diverse marine life.

3.4.3 Sea Angling

Sea angling is a popular sporting activity occurring on Loch Fyne (Figure 3.4) and is available all year round from both boat and shore. Most shore angling is on the west shore of the loch with Crarae and Furnace being notable hotspots (pers. comm. John Crowther SFSA, 12th June 2008). The east shore also produces good sport from the rock ledges between Otter Ferry and Strathlachlan, plus the shingle beaches between Strachur and St. Catherines (pers. comm. John Crowther SFSA, 12th June 2008).

While large cod, thornback ray, whiting, haddock and flatfish may be less plentiful, they are still present in the loch. However, local and visiting anglers have diversified and are devoting attention to other species such as pollack, wrasse, conger eel and lesser spotted dogfish. Mackerel are also numerous in the summer months and, in some years herring are also landed.

Sea angling from the shore is very popular with many anglers travelling long distances to sample the sport on offer or participate in the open shore sea angling competitions sponsored by the Scottish Federation of Sea Anglers (pers. comm. John Crowther SFSA, 12th June 2008).

Loch Fyne Services operate from Lochgair and offer fishing charter boat hire for wreck/reef and bank fishing, tuna fishing, and specimen hunting. Based in Ardrishaig, Sorcha Boat Charters provide sea angling charter from May to January each year, operating from Inveraray to Tarbert.

Argyll Caravan Park, near Inveraray, also offers angling boats for hire from their site for use in the vicinity.

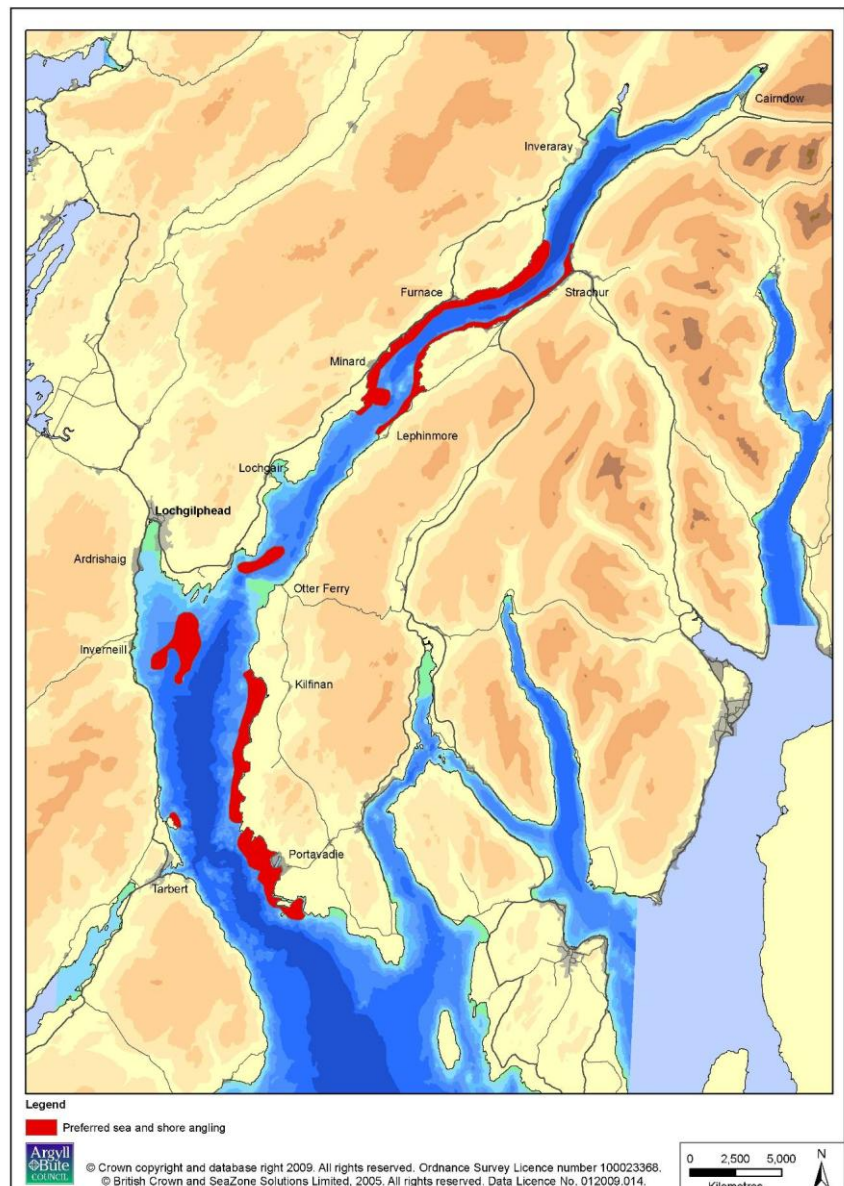


Figure 3.4 Areas of preferred shore and boat angling

3.4.4 Sailing, Marine Wildlife Watching and Other Water Sports

Sailing

Sailing is a popular activity with many vessels entering the loch to use the Crinan Canal to gain easy access to the waters off the west coast. Sailing attracts a variety of marine tourists, and includes various sailing experiences, such as cruising, recreational chartering and recreational racing.

Tarbert Yacht Club run racing activities and competitive sailing events take place in the summer each year, including the Bell Lawrie Scottish Series. Ardrishaig has a boat club with approximately 30 moorings in Loch Gilp and it also has a private jetty and storage facilities. Based at Ardrishaig, SeaTrek Training specialise in commercial and leisure training courses within the loch for sailing and motorboats.

In addition to the busy marina at Tarbert Harbour, Loch Fyne now hosts a second marina at Portavadie, which was opened in July 2007, and Ardrishaig services boats in transit through or resident in the Crinan Canal. These three harbour developments are discussed in more detail in section 3.6.

There are also several mooring areas, primarily East Loch Tarbert, Barmore Island, Loch Gair, Otter Ferry, Strachur, Stuckreoch and Newton. The anchorages within the loch were agreed between Clyde Fishermen's Association and sailing bodies to ensure that anchorages were not disturbed by fishing activity and vice versa.

Upper Loch Fyne, north of Loch Gair, is often perceived as a remote dead-end, and so sees relatively little visiting sailing traffic. Inveraray is the population centre with plenty to offer on shore, but with little to offer in the way of marine facilities. Elsewhere in the upper loch, infrastructure is limited to a few piers and slipways and several visitor moorings.

Marine Wildlife Watching

Loch Fyne Services offer a marine wildlife cruising day around the Isle of Arran, Holy Island, Bute and Loch Fyne. Half-day charters are also possible, during which time the boat can be used for fishing, diving, marine wildlife watching and sightseeing. In addition, many other recreational activities such as diving, kayaking, sailing, angling and coastal walking offer opportunities to view marine wildlife which are considered as an important part of the experience.

Other Water Sports

Windsurfing occurs off Minard and jet-skiing is popular along the shores near Minard, Inveraray, East Loch Tarbert and Stuckreoch. Sea kayaking also occurs in Loch Fyne, taking advantage of the number of small islands, scenery and wildlife.

3.4.5 Economics

The socio-economic review for the Firth of Clyde (EKOS 2008) estimated that the turnover from recreation and tourism in Loch Fyne totalled £35.8 million in 2005, an increase of £8 million from 2000. Gross Value Added (GVA) totalled £11.5 million in 2005, compared to £11.7 million in 2001.

The report also identified that recreation and tourism employed approximately 630 people in Loch Fyne, which is down 18% from 2000.

Sea Angling

Previously, very little was known about the scale of sea angling, its distribution across Scotland, or the economic impact of sea anglers' expenditure. The Scottish Government has sought to rectify this by commissioning an assessment of sea angling and its contribution to employment and income in both Scotland as a whole and its regions. Nationally the total annual sea angler expenditure (£140 million) was estimated to be as significant as the value of Scotland's game and coarse angling (Radford & Riddington 2004). In Argyll and Lochaber the estimated total annual expenditure was £22,623, with an estimated 524 jobs supported (Radford & Riddington 2004; Radford *et al.* 2009)¹⁰. Over this area, Ardrishaig and Lochgilp were identified as popular launch sites and Loch Fyne as a popular shore angling location.

Sailing

Of all the water-based activity, sailing is by far the biggest generator of economic activity. Figures of economic value for Loch Fyne are not available but, within the Clyde Estuary there are over 2,700 permanent marina berth holders and 2,000 moorings with an annual spend per permanent boat of around £7,000. Of the £250 million generated in Scotland, it is estimated some £80 million is based on the Clyde. £40 million of this is directly generated by yachts visiting or berthed on the Clyde (Cole 2007). Table 3.3 identifies the extensive berths and visitor moorings available throughout the Loch Fyne area (Wilson 2008).

¹⁰ It should be noted that all sea angling figures have been taken from a recent Scottish Government Report (<http://www.scotland.gov.uk/Publications/2009/07/31154700/0>) The calculation of these estimates are extremely complex and figures for expenditure and jobs supported relate to both direct and indirect effects, including fuel, food, bait, charter costs, accommodation, boat & rod hire, clothing and books.

Table 3.3 Location of visitor moorings and berths in Loch Fyne in 2008 (Wilson 2008)

Port or Area	Number of berths/moorings available
Creggans Inn, Strachur	5
Oystercatcher Hotel, Otter ferry	5
Loch Fyne Oysters, Head of Loch Fyne	4
Tarbert	60 (+80 in Sep. 2008)8
Portavadie	230
Ardrishaig	1

3.4.6 Potential Impacts and Conflicts

Potential impacts from recreational activities and development can include:

- Competition for space between moorings/anchorages and aquaculture development/commercial fishing;
- Competition for berthing space between recreational vessels and commercial vessels where existing harbours or marinas are redeveloped;
- Reduced water quality – the discharge of untreated sewage from vessels concentrated in large numbers may have the potential to affect the high standard of water quality required for shellfish growing;
- Inconsiderate behaviour: participants undertaking recreational activities such as angling, diving and kayaking can affect road traffic and private property if participants park in inappropriate areas. Noise, litter, and a lack of changing and toilet facilities can also be an issue;
- Disturbance to marine and coastal wildlife;
- Disturbance of sensitive seabed habitats or historic heritage interests from anchoring and the scouring action of mooring chains; and
- Inappropriate use of jet skis and small power boats could be a safety risk or nuisance to other activities including kayakers, divers, fishing and commercial shipping vessels.

Conflicts with other sectors:

- New marine development, such as aquaculture development, can affect safe navigation or safe entrance to designated anchorages;
- Marine litter is seen as a threat to recreational activities and tourism and floating debris can be a hazard to leisure boats;
- Wash from large vessels, such as ferries and naval craft, has the potential to affect the safety of other loch users e.g. divers and small vessels such as angling boats and kayakers; and
- Recreational anglers have expressed concern about the reduction in local stocks of sport fish.

3.4.7 Existing Management and Controls

Many of the potential conflicts listed above can be and have been fully or partially mitigated by the following codes of conduct and environmental programmes, which are relevant to marine and coastal recreation and should be followed by users as good practice:

- Scottish Outdoor Access Code;
- Scottish Marine Wildlife Watching Code;
- The Green Blue, the joint environment programme for the Royal Yachting Association and British Marine Federation;
- Scottish Canoe Association – Paddlers Access Code & Where to 'Go' in the Great Outdoors - Human Sanitation Advice for Paddlers;
- Scottish Sub-Aqua Club - Land Access Guidance for Divers; and

- British Sub-Aqua Club - Respect Our Wrecks Code.

Further information on these codes and programmes can be found in Appendix VII.

3.4.8 Required Consents for Recreational Development

Section 3.6.2 provides details of the relevant consents required for developments such as moorings, pontoons, slipways and piers.

3.4.9 Future Development

Loch Fyne clearly has much strength as a marine leisure destination with rich scenic, cultural, historic and wildlife qualities as well as safe waters, good accommodation and eating opportunities. However, the biggest constraint to the development of marine and coastal recreation is the lack of facilities, including parking for vehicles and boat trailers, toilets, access points, and coastal infrastructure such as moorings, berthings, slipways, piers, etc. Improving or adding to existing physical infrastructure is vital to supporting and assisting the marine leisure industry and other commercial activities.

Opportunities¹¹ to improve marine access or coastal infrastructure for recreational activities are identified in individual policy zones in Section 5. Strategic coastal infrastructure development and improvements would bring significant economic development opportunities to the area.

Access

Access to marine waters for activities such as diving, angling and kayaking is poor in many places. Issues currently exist on both sides of Loch Fyne where divers, and sometimes anglers, park in passing places causing traffic problems, or on private property that can block private access. There is clearly a lack of parking in some locations, in addition to a lack of facilities such as toilets and changing areas.

There is an opportunity to include provision for improved access to the water and facilities for recreational users as part of new development proposals, including onshore aquaculture development, new business proposals such as cafes or restaurants or development of new and improvement to existing coastal infrastructure. Such proposals could explore the potential for allowing boaters/kayakers, divers and anglers to access proposed infrastructure or to provide additional parking, dedicated launching points or toilet facilities. It should be noted however that the regular public use of fish farm access points may present issues in relation to public liability and disease control.

To enable improvement of access for recreational facilities and alleviate current access issues it will be necessary to take a strategic approach and identify and assess all access points for different activities across Loch Fyne. This will enable the identification of where access is most appropriate, where access should be directed elsewhere, and opportunities for new access points. The development of dedicated access points could take pressure off other less suitable locations currently used and provide economic benefit to nearby services. Derelict land sites could be sacrificed as areas for parking or toilets.

Motorised Water-sports

It is possible that the level of power boating and jet skiing in Loch Fyne may increase in the future, particularly if restrictions are put in place on Loch Lomond. If a significant increase in the use of Loch Fyne occurs, it may be appropriate to consider identifying appropriate areas for these activities in relation to other users and interests.

Sailing

There have been a number of studies that have looked at the potential to develop sailing in the Clyde and Argyll and the Islands:

¹¹ It should be noted that engineering feasibility or detailed economic justification for these development opportunities has not been assessed.

- Sailing in the Clyde Estuary – The Potential for Future Development (A Market Assessment, Economic Impact Study and Action Plan) - McKenzie Wilson Network Partnership Group (June 2006);
- Overview of the Marine Leisure Tourism Sector in Argyll and the Islands – Stewart Miller Associates (July 2004);
- Sail West Project, 2007. A Strategic Programme for the Development of Marine Leisure Activities and Infrastructure in the Republic of Ireland Border Region, Northern Ireland and the West of Scotland.

All of these studies have highlighted the growth potential of the recreational sailing/marine leisure tourism industry and the requirement for infrastructure and facility improvements in order to facilitate that growth. Improved communications and collective promotion were also identified as means of improving business.

Within Loch Fyne, Tarbert and Inveraray have been identified as requiring additional facilities, whilst upper Loch Fyne was noted as having insufficient step ashore facilities and moorings, and that additional facilities in the upper loch would encourage visiting boats to use the area more extensively as a 'micro cruising area'. Little in the way of infrastructure may actually be needed apart from more visitors' moorings and perhaps better slipway access for small trailed craft.

The recent establishment of Portavadie marina provides the ideal link between the rest of the Clyde Estuary and Loch Fyne, which increases the potential to successfully develop new facilities further up the loch to encourage recreational boaters to visit upper Loch Fyne. New facilities would spread business, disperse economic benefit to a larger group of communities and attract more boats to Tarbert overall. Opportunities could also exist for individual businesses that can attract sailing parties because of the quality of a specific product (e.g. restaurant) combined with an attractive location. Any increase in visitors could also provide economic benefits to the communities of upper loch locations such as Otter Ferry, Strachur, Minard, Furnace, Inveraray and Cairndow.

3.4.10 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development' and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Recreational Activities – **Recommendations 7, 8, 10, 11, 12, 13, 24 - 28; Good Practice 1 - 3, 7 - 11.**

3.5 Commercial Marine Traffic

3.5.1 Oil Tankers and Cargo Vessels

With shipping still the main form of cargo transport into and out of Britain, it is clear that maritime trade is very significant economically. On the Scottish west coast, the main cargo shipping route is through the Minch to the North Channel or into the Clyde. There is also significant movement of oil tanker traffic down the Minch through the North Channel to refineries within the UK and Ireland. An incident in the Clyde could therefore have the potential to impact Loch Fyne.

The Argyll and Bute Council Transport Strategy promotes the continued shipment of goods by more sustainable modes e.g. sea and includes an action to identify new strategic locations for freight transfer such as Furnace on Loch Fyne. Sea transport has obvious benefits where there is community resistance to intrusive lorry movements through residential areas or via inadequate public roads, where congestion is likely. This strategy can be found at <http://www.argyll-bute.gov.uk/content/roadsandtransport/transportationstrategy/movingforward2/>

Timber Transshipment

Within Loch Fyne, the only form of cargo transport is the export of timber from Ardrishaig and Portavadie. TimberLINK operate out of Ardrishaig, shipping 160,000 tonnes annually (pers. comm. Argyll Timber Transport Group 2008). Iggesund Forestry operates out of Portavadie, handling approximately 35,000 tonnes of timber annually (pers. comm. Ewan MacDonald, 1st August 2008).

Marine access points served by dedicated forest road networks can offer significant commercial, economic, social and environmental benefits. A redundant pier facility exists at Furnace which would require some upgrading but offers the opportunity of export from forest areas adjacent to the port, particularly if linked directly to the forest road network. The forest industry hope to export timber from Furnace in the near future, however, the existing pier requires significant upgrading and it is hoped that a Freight Facilities Grant may be available to support this.

Windfarms require the delivery of large heavy loads that if transported by road would cause significant traffic disruption to other users. The transportation of these turbines by sea reduces the amount of time they are on the road. The possibility for bringing in wind turbines by sea to Ardcastle, via the existing pier and then by road via the forest network to Loch Awe, is being explored by Green Power and the Forestry Commission. Upgrading of this pier may also allow the transport of timber by sea from this location.

3.5.2 Passenger Ferries & Cruise ships

Caledonian MacBrayne operate passenger ferries to Portavadie and Lochranza (winter only) from Tarbert. Cruise ships visit Inveraray during the summer months and can be seen anchored at the mouth of Loch Shira.

Table 3.4 Ferry traffic in Loch Fyne

	1996	2000	2006	% increase
Passengers	39200	37500	67600	72%
Cars	12,500	15,000	19,100	53%
Commercial and buses	-	500	900	80%

Table 3.4 shows that there has been considerable growth in ferry traffic across Loch Fyne. Since 1996 the number of passengers using this crossing has increased by 72% and the number of cars by 53%. Considering the Firth of Clyde ferry traffic as a whole, the increases are much more moderate, with passengers increasing by 5.5%, cars by 13% and commercial and bus traffic by 21% (Wilson, 2008).

3.5.3 Existing Management and Controls

Argyll and Bute Council have prepared an Oil Spill Contingency Plan which will be used by Argyll and Bute Council, Maritime and Coastguard Agency, SEPA, SNH, Port and Pier users and local interest groups when dealing with spills or the threat of spills within the Council area.

The Argyll and Bute Council Oil Spill Contingency Plan consists of two volumes. Volume 1 (Shoreline Protection Plan) includes the full arrangements for the management of and response to any oil spill within the council area and also includes details of response to pollution to the shoreline. Volume 2 (Ports and Piers Oil Spill Contingency Plan) includes the information necessary to plan for and respond to an oil spill occurring within the Council's statutory harbours and in the vicinity of the Council-owned piers.

3.5.4 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development', and 'Good Practice', outlined in Sections 3.12 and 3.13 are relevant to Commercial Shipping – ***Recommendations 8, 25, 27; Good Practice 1 & 2.***

3.6 Coastal Infrastructure

3.6.1 Harbours and Ports

The three main harbour areas in the loch are Tarbert, Portavadie and Ardrishaig.

Tarbert

Tarbert harbour is currently in the ownership of Tarbert (Loch Fyne) Harbour Commissioners and its uses are leisure, fishing, commercial and as an operating ferry terminal. Floating pontoons at the north of the harbour provide berthing for recreational sailing and power vessels and there has been a recent extensive development to provide more berthing spaces for yachts. Tarbert is regularly used as a base for several high profile yacht races.

Tarbert Harbour has 200 m of quay available for use by fishing vessels and fish farm vessels plus 60 m for use by creelers. A local shellfish company hold and supply bait for creel boats and live shellfish holding is provided by three businesses.

Given the multiple commercial and recreational uses of Tarbert Harbour, the competing needs for space, and the need to refurbish much of the existing infrastructure, Tarbert (Loch Fyne) Harbour Authority has developed a 5-year improvement plan.

Portavadie

Portavadie port is privately owned by Argyll and the Isles Enterprise. Originally the site for an oil construction yard which never became operational it has recently been converted into a 230 berth marina (Wilson 2008). In addition to the 230 berths, the marina includes full shore-side facilities including a bar/restaurant and luxury self-catering apartments.

In addition to the Marina Development, the harbour at Portavadie is used by Calmac who operate a ferry across Loch Fyne to Tarbert and for the transhipment of timber (see section 3.5).

Ardrishaig

Ardrishaig Harbour, privately owned by British Waterways provides the entrance point to the Crinan Canal and as such is very busy during the summer months when numerous recreational sailing vessels use the Canal to access to west coast sailing waters. The harbour is also heavily used by TimberLink for timber exportation (see section 3.5). On the south side of the harbour, there are areas for pontoons and anchoring of boats. Ardrishaig is also a landing port for commercial fishing vessels.

The Argyll and Bute Development Plan identifies Ardrishaig waterfront and village centre as an 'Area for Action'. Argyll and Bute Council and British Waterways have funded a study to produce a masterplan which will aid, guide and inform management, revitalisation, promotion, and where appropriate, the redevelopment of this area.

3.6.2 Relevant Consents for Coastal Infrastructure Development

Required consents	Regulator	Details
Seabed Lease	The Crown Estate	Where the foreshore/seabed is owned by The Crown Estate an operator must apply for a lease for the right to occupy the area.
Planning Permission	Argyll and Bute Council	Planning consent is required from the relevant planning authority for coastal development above the mean low water mark.
Coast Protection Act 1949 - Section 34 Consent	Scottish Government, Ports and Harbours Division	Section 34 consent is required for any mooring or coastal infrastructure development. The purpose of control under Section 34 is solely concerned with the safety of navigation.

FEPA Licence	Marine Scotland - Science	Consent is required under Part II of the Food and Environment Protection Act 1985 (as amended) (FEPA) for the deposit or placement of substances, articles and materials that it is proposed to use during construction. FEPA consent is also required for dredging material.
Ports and Harbours Orders	Scottish Government, Ports and Harbours Division	This consent aims to regulate harbour developments and activities.

3.6.3 Loch Access

There are a considerable number of private and public piers, slipways, pontoons, moorings and anchorages throughout Loch Fyne. Much of this infrastructure is in poor condition and need of maintenance.

Overall, there is a lack of suitable infrastructure in many parts of Loch Fyne (see Section 3.4.9). Improving or adding to existing physical infrastructure is key to supporting and assisting the marine leisure industry and other commercial activities.

3.6.4 Road Infrastructure

The settlements on the west coast of Loch Fyne are serviced by the A83, which is also part of the Argyll Coast Tourist Route. However, this road goes inland at Tarbert to West Loch Tarbert and the coastline from Tarbert south to Skipness is not fringed by road. The east side of the loch is served by the A815 and A886 from Cairndow to Newton and then the B8000 which stretches to just inland of Portavadie.

The A classification roads on the western side of the loch are in general of higher carrying capacity for commercial, residential and tourist traffic, compared to the roads on the east of the loch which serve smaller communities, and for the majority of the coast, are only of B classification. In particular, it has been noted that the B8000 on the Cowal peninsula becomes very busy in the summer with scuba divers parking on the roadside. The Forestry Commission also uses the road network around the loch for moving timber.

A section of the Argyll Coastal Tourist Route runs from the head of Loch Fyne, along the A83 through Inveraray, Furnace, Minard and Lochgilphead before running back inland on the A816 to Oban.

3.6.5 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development', outlined in Section 3.12, are relevant to Coastal Infrastructure – **Recommendations 6 - 11, 24 & 28.**

3.7 Marine Infrastructure

3.7.1 Navigation markers

The Northern Lighthouse Board is responsible for the management of all lighthouses, buoys and beacons throughout Scotland and the adjacent seas and islands, including the Isle of Man, under Section 195 of the Merchant Shipping Act 1995. They have various powers and responsibilities in connection with the provision, maintenance, alteration, inspection and control of lighthouses, buoys and beacons together with wreck removal powers. This also covers fish farm beacons, moorings etc.

There are lighthouses at the Minard Islands, Otter Spit, Glas Eilean off Port Ann, Ardrishaig Pier, Ducuan Island in Loch Gilp, and Sgat Mòr south of Portavadie. The main clusters of marker lights are between Otter Ferry and Port Ann (where the loch narrows), Ardrishaig, and Portavadie.

3.7.2 Subsea Cables

There are several subsea cables present in Loch Fyne. The majority of these are telecommunications cables, some of which are out of service but are of scientific interest. In addition, there is a subsea power cable between Otter Ferry and Port Ann. Subsea cables can restrict development and marine activities and have the potential to be damaged by moorings, anchoring and some fishing activities.

3.8 Ministry of Defence

The majority of Loch Fyne is classified as a submarine exercise area in which Naval submarines operate on and below the surface. Submarines also occasionally tow sonar equipment in the loch and vessels are advised to keep a look out for submarines when passing through the loch and to remain 1500 m clear when crossing astern of a surfaced submarine.

Additionally, there is a Ministry of Defence (MOD) exercise area in the upper loch, used for the running and turning of submarines and other vessels. This encompasses a smaller MOD hydrophone area and is closed to fishing and anchoring.

3.8.1 Existing Management and Controls

Submarine Activity

The MOD have agreed to inform Clyde Fishermen's Association in advance of the timing and approximate location of submarine activity in Loch Fyne to minimise interaction between the sectors.

Mine Exercises

The MOD informs the Clyde Fishermen's Association in advance of the coordinates of mine exercise areas.

Fish farm vessels

There is also an arrangement with Lighthouse Caledonia where fish farm vessels in the vicinity of the MOD area are asked to turn off their engines during noise sounding.

3.9 Forestry & Agriculture

The land that drains into Loch Fyne is sparsely populated and primarily used for non-intensive agriculture. On account of the steep rocky hill-land that surrounds the loch, land-use is restricted to extensive livestock production and forestry.

The hill land is used for hill sheep production and deer stalking with the gentler hill slopes either afforested or used for beef, pig and hill-sheep production. Forestry within this area is actively managed and a significant area is reaching maturity and due to be harvested.

SEPA and the Forestry Commission are working together through the River Basin Planning Process to ensure that future forestry plantations meet the requirements of the Water Framework Directive. Essential drainage works will also be carried out after harvest and prior to any replanting.

3.9.1 Potential Impacts

Both agriculture and forestry can affect the water environment through diffuse pollution. Run-off from forestry plantations can cause acidification of water courses and silt run-off from operations can damage habitats, especially for migratory salmon and trout.

3.9.2 Existing Management and Controls

Forest and Water Guidelines (4th Edition 2003)

These guidelines give guidance to forest managers on how forests should be designed and operations planned, and to practitioners on how field operations should be carried out in order to protect and enhance the water environment.

General Binding Rules (GBRs)

Under the Water Environment (Diffuse Pollution) (Scotland) Regulations 2008, GBRs came into force in April 2008. They provide a statutory baseline for good practice and their implementation will help to improve water quality. GBRs cover activities such as storage and application of fertilizers, keeping of livestock, cultivation of land, discharge of surface water run-off, construction of water-bound roads and tracks, application of pesticide and operation of sheep dipping facilities.

3.9.3 Good Practice

The following 'Good Practice', outlined in Section 3.13 is relevant to Forestry and Agriculture - ***Good Practice 4.***

3.10 Marine Renewable Energy

Argyll and Bute has significant renewable resource of hydro, wind, wave, tidal and biomass, and a long history of renewable energy development. This area therefore has a significant role to play in both the UK and Scottish Climate Change Programme targets for renewable energy. Argyll and Bute Council aim to promote the full range of renewable energy resources available and to achieve this, partnerships are being developed with renewable energy companies to maximise the benefits for communities throughout Argyll and Bute.

The Scottish Government has a target of meeting 50% of Scottish demand for electricity from renewables by 2020. To do so will require the effective and successful development of new renewable technologies and it is expected that the contribution of developing sectors like wave, tidal and offshore wind will become increasingly important. The scale of Scotland's marine renewable potential is vast. The total wave resource is estimated at 14 GW (10% of EU total) with 7.5 GW of tidal power (25% of EU total). Scottish Ministers are committed to seeing 10MW of wave and tidal energy deployed by 2010.

3.10.1 Potential Impacts/Conflicts

Arrays of wave or tidal marine renewable devices have the potential to restrict navigational or access for fishing vessels, shipping and leisure craft. However, many tidal devices are submerged, which may not restrict boat traffic. Wave and tidal development may also compete for space with activities like commercial fishing and aquaculture.

A Strategic Environmental Assessment (SEA) of the development of wave and tidal power around the West and North coasts of Scotland has been conducted. The SEA examines the possible environmental impacts and effects associated with the deployment of a range and number of wave and tidal devices in the context of where the best resources are to be found.

3.10.2 Required Consents for Marine Renewable Development

Required consents	Regulator	Details
Electricity Act 1989 – Section 36 Consent	Scottish Government – Energy Consents Unit	Consent required for construction, extension and operation of a wave or tidal power generating station with capacity of 1 MW or more.
FEPA Licence	Marine Scotland - Science	Consent required under Section 5 the Food and Environment Protection Act 1985 (as amended) (FEPA) for the deposit or placement of substances, articles and materials that it is proposed to use during construction.
Coast Protection Act 1949 - Section 34 Consent	Scottish Government, Ports and Harbours Division	The purpose of control under Section 34 is solely concerned with the safety of navigation.

3.10.3 Future Development

Wave and tidal resource assessments for Scotland have not identified any significant wave or tidal energy resource in Loch Fyne. While it is unlikely that large-scale wave or tidal developments will occur in Loch Fyne, there may be potential for small-scale devices, such as the Wavegen 'Breakwater Turbine', to be incorporated into breakwaters, coastal defences, land reclamation schemes or harbour walls.

3.10.4 Recommendations and Good Practice

The following 'Recommendations for Future Management, Use and Development', outlined in Section 3.12 are relevant to Marine Renewable Energy- **Recommendation 9.**

3.11 Local Issues & Agreements

Local Issues and Agreements

Throughout the process of developing this plan, local issues have been identified through the Loch Fyne ICZM stakeholder group and, where possible, local management agreements have been implemented to address these issues. Marine and coastal users are encouraged to follow the issues and agreements detailed below.

Shoreline debris

Issue

Shoreline debris was determined to be a problem but it was not possible to establish the origin of much of the debris as the loch opens into the Firth of Clyde and hence it could be coming from many sources. However, in the past a significant proportion of the debris had originated from plastic fish farm feed bags. The GRAB Trust has information and contacts regarding beach cleans using the Marine Conservation Society method.

Local management Agreement

Lighthouse Caledonia has agreed to use heavy duty feed bags instead of polythene bags, which are more easily stowed and less likely to be blown into the loch. Stakeholders should contact The GRAB Trust if they would like to pursue clean-ups using the Marine Conservation Society method.

Floating debris

Issue

Loch users noted that they regularly come across floats from finfish and shellfish farms.

Local management Agreement

Operators agreed to collect stray buoys if informed of their location by loch users. Contact details were distributed.

Fish farm anchors and floating line

Issue

Anchors may be poorly marked and often become detached causing a navigational hazard with floating line on the surface. Northern Lighthouse Board confirmed that the markers being used are those that are recommended. All Lighthouse Caledonia sites are marked with navigation buoys (poles with flashing lights) and vessels should stay well seaward of these to avoid contact with anchor marker floats. Vessels without radar should take care when navigating around sites. Angling boats rented by Alistair Sinclair have notices telling users to stay away from the farms.

Local management Agreement

Loch users to contact Lighthouse Caledonia if they come across faults or problems.

Fish farm anchors located outside leased areas

Issue

Lighthouse Caledonia stated that this is case at some sites as some cages were placed before accurate GPS technology was widely available. However, the area utilised under the agreement is the same.

Local management Agreement

It was agreed that moving the sites would be problematic due to: SEPA sampling which is conducted in the same locations relative to the cages and if cages were moved this data would then need to be disregarded; moving sites would mean another period of anchor settlement during which time there is possible movement of cages; some were positioned with input from the other users e.g. trawlers so that turning areas remained viable. Movement of cages would therefore result in renegotiation.

Distribution of other species caught in cages as bait

Issue

Fish species, mainly saithe and mackerel, enter the cages as juveniles. These then grow alongside the salmon and are unable to escape due to their size. It was suggested that during harvesting these fish were put aside and supplied to creelmen as bait.

Local management Agreement

The Scottish Government indicated that if fish were being passed on to creelmen without exchange of money, there was no legislation covering this, although it was considered bad practice. However, if money was being exchanged it would be necessary for the farm to hold quota and licences for the species being sold and therefore the activity would be illegal. Lighthouse Caledonia management issued a directive to staff calling a halt to this activity, which should no longer be occurring.

Harvesting via wellboat

Issue

Lighthouse Caledonia has now started harvesting salmon from sites in Loch Fyne using a wellboat.

Local management Agreement

Lighthouse Caledonia to communicate with creelmen prior to deploying wellboat to identify where creels are located to avoid gear being lost by accidental contact between the wellboat and creel fleets.

Prawn trawling in Loch Shira

Issue

Populations of the rare *Pachycerianthus multiplicatus* anemone identified by 'Seasearch' surveys (2005 and 2006) in Loch Shira have potential to be damaged by trawling activities.

Local management Agreement

A voluntary agreement was reached with the Clyde Fishermen's Association, not to trawl shallower than 20 m in order to protect the anemones.

General conduct on the water

Local management Agreement

Loch users should consider other activities whilst conducting their own, e.g. causing too much wake when creelers or mussel farmers are hauling equipment or lines.

Navigational hazard from timber shipping

Issue

The Loch Fyne ICZM group identified stray logs from timber loading at Ardrishaig as a hazard to navigation.

Local management Agreement

An agreement was reached between TimberLINK and British Waterways, where Ardrishaig based Sorcha Boat Charters have been contracted to collect any logs that are reported within the loch. A similar system is in place at Portavadie (pers. communication with Lesley McFadyen, 17th November 2005).

3.12 Recommendations for Future Management, Use and Development

Marine and coastal users, developers and regulators are encouraged to take account of the following recommendations on the future management, use and development of Loch Fyne. These recommendations have been developed by Argyll and Bute Council's Marine and Coastal Development Unit, based on information gathered and discussions with stakeholders and regulators throughout the development of this plan. Many of these recommendations will require funding and the cooperation of relevant parties.

Specific actions following from these recommendations are presented in an Implementation Action plan in Section 8.

Development proposals		
Aquaculture	1	The development or relinquishment of undeveloped seabed leases for aquaculture sites should be encouraged, in order to give others the opportunity to use these sites.
	2	Should any existing shellfish or finfish site be relinquished in the future, all equipment, including anchors and mooring blocks should be removed from the seabed to avoid conflict with commercial fishermen, recreational anglers and sailors.
	3	Any new finfish companies proposing to operate within Loch Fyne or the Kyles of Bute should sign up to and operate any new sites as part of the Clyde Area Management Agreement.
	4	The effect of new finfish development on wild migratory salmonids, monitored through the existing Area Management Agreement and work of its members, including data from the restoration project, should feed into subsequent planning decisions.
	5	The potential for a users committee, as a single point of contact for pre-application consultation for aquaculture development proposals should be explored.
Coastal infrastructure	6	Development proposals for new or redevelopment of existing coastal infrastructure, including marina development, should take account of the needs of the fishing industry to ensure the maintenance of existing and development of additional facilities.
	7	Where new coastal infrastructure or aquaculture shore-base development is proposed, consideration should be given, where appropriate, to permitting public use of slipways and jetties where appropriate, in order to facilitate recreational or other commercial use of the area.
	8	Where upgrades to existing coastal infrastructure are being considered for sea transport, the potential to provide access and facilities for other users, both commercial and recreational should be considered as part of the development proposal.
	9	The potential to incorporate small-scale renewable devices, such as the Wavegen Breakwater Turbine should be considered where appropriate, as part of any proposals for new large-scale coastal infrastructure or significant improvements to existing piers and harbours.
	10	Any proposals for new marinas or large mooring developments should give particular consideration to the potential to affect water quality that may pose a risk to existing shellfish farms, the Loch Fyne Coastal Strip Shellfish Growing Water and Shellfish Production Areas.
	11	The consideration of development proposals by relevant authorities should take account of the possible risks from climate change. Coastal development proposals around Loch Fyne should be consistent with the Argyll and Bute Local Plan Policy LP SERV 8 Flooding and Land Erosion – The Risk Framework for Development.

Moorings	12	Mooring development should be avoided in areas where sensitive seabed habitats, such as maerl or <i>Limaria hians</i> beds occur and mooring types that reduce seabed footprint and scour should be promoted.
Recreational facilities	13	Toilet pump-out facilities for recreational vessels should be considered in any large scale marina development or redevelopment of existing facilities.

Activities		
Aquaculture	14	Finfish and shellfish operators should ensure that farm structures and operations take place with lease boundaries.
	15	The potential for using waste from shellfish processing as bait for the creel fishing industry should be considered in light of the current Seafish project which is looking at cost effective ways to utilise shellfish waste (see section 6 for more details).
	16	With respect to the cultivation of a new aquaculture species, the relevant authority and aquaculture company should follow the procedures laid down in the ICES code of practice which aims to reduce the risk of introducing non-native species via aquaculture (ICES 2005).
	17	For new non-salmonid farms in Loch Fyne, production should not start until a separate annex for non-salmonid farming has been developed as part of the current AMA'.
Commercial fishing¹²	18	Continue to improve the sustainability of local fisheries through the development of new and increased uptake of existing fishing measures and practices, designed to improve sustainability, such as measures to reduce bycatch and capture of undersized prawns.
	19	A well designed system of incentives for uptake of measures designed to improve sustainability of fishing practices should be explored.
	20	Improved cooperation between static and mobile gear fishing should be explored by the proposed Clyde IFG and the current weekend ban on trawling in Loch Fyne should be continued to help reduce gear conflict.
	21	Fisheries management should be undertaken through action by national and international authorities. Any local fisheries management should be well defined and adopted by the Clyde IFG for implementation.
	22	Accreditation for sustainably fished products through schemes such as the Marine Stewardship Council should be encouraged.
	23	When developing and agreeing future management measures for commercial fishing in Loch Fyne, the proposed IFG for the Clyde should take account of the following: <ul style="list-style-type: none"> • The socio-economic importance of commercial fishing to local communities; • Information and results of projects undertaken by CFPD, and other relevant research; • Sensitive seabed habitats, species and important areas for biodiversity, identified in section 2.3 of the plan.
	24	Existing marine access points to Loch Fyne should be identified for each recreational activity to assess whether existing access points are appropriate, what improvements could be made, where access should be directed elsewhere, and opportunities for new access points and changing/toilet facilities.

¹² It should be noted that these recommendations have not been discussed by or approved by the newly established Clyde Inshore Fisheries Group.

Recreation	25	Existing used anchorages should be safeguarded from marine development and navigational access to recognised moorings and anchorages should be maintained.
	26	Once the Core Path Plan is complete, opportunities to provide interpretation that could promote activities and business in the Loch Fyne area as well as natural heritage and historical interests should be explored, where appropriate.
	27	If power boating/jet skiing increases significantly in the future it may be appropriate to consider identifying appropriate areas for these activities, in relation to other users and interests.
	28	Development of appropriate areas for car parking and/or lay-bys in areas popular with divers, anglers, and sea kayakers on the B8000 Cowal Peninsula and the A83 in the upper loch, should be considered in order to reduce existing traffic issues.

Improving knowledge

Species & habitats	29	Encourage further research to build up a better understanding of the distribution and abundance of marine and coastal species and habitats, in particular mobile and migratory species and their sensitivity to activities and development.
Maerl/flame shell beds	30	Additional Seasearch surveys should be considered to confirm the presence and distribution of maerl and flame shell beds around Otter Spit.
Seagrass (<i>Zostera</i>)	31	Survey work to establish the presence and condition of seagrass <i>Z. marina</i> , as previously reported in the lower areas of Loch Gilp (McLusky 1986), should be considered.
EIA datasets	32	All natural heritage datasets, including those gathered for Environmental Impact Assessments (EIA), should be made available to developers.
Commercial fisheries	33	Encourage the continuation of the Clyde Fisheries Development Project (CFDP) and new research into both the economic and environmental sustainability of current fishing practices.
Wild salmonids	34	Research is required to improve the understanding of the migratory route of wild migratory salmonids through Loch Fyne.
Risk to wild salmonids from sealice	35	To improve knowledge and potentially provide additional guidance in relation to assessing the risk of the transfer of sealice from farmed to wild salmonids, a research project to develop a sea lice dispersion model for Loch Fyne should be investigated. This project has wide support from the members of the Firth of Clyde Area Management Group.

Safeguarding/restoring the Natural & Historic Environment

Marine biodiversity	36	Voluntary approaches to protecting important areas of marine biodiversity such as adherence to codes of conduct should be encouraged.
Climate change	37	Support should be provided by relevant authorities to enable the aquaculture and fishing industries to take advantage of the positive effects of climate change and where possible safeguard against the negative effects.
Wild salmonids	38	Efforts to improve the populations of wild salmon and sea trout returning to Loch Fyne rivers should be fully supported by all relevant agencies and regulators.
Water quality	39	The potential risk to water quality for shellfish growing, from existing and future polluting sources should be explored further in order to provide more accurate guidance in future revisions of the plan.

3.13 Good Practice

The following good practice should be followed by marine and coastal users when operating within the marine waters, and coastal area of Loch Fyne.

1. Loch users are encouraged to report sightings of basking sharks and marine mammals to the relevant agencies/conservation groups. Details of recording schemes and contact details can be found in Appendix III.
2. Guidance from SNH and the UK 'marine aliens' project has identified that the spread of marine alien species can be reduced by:
 - Reporting any sightings
 - Not moving non-native species to new locations
 - Maintaining boat hulls clear of fouling organisms
 - Cleaning boats and equipment before transporting them from one water body to another
 - Cleaning and drying dive and fishing gear after use
 - Not releasing aquarium plants or animals into the environment

More information can be found in Appendix III.

3. Divers visiting wrecks in Loch Fyne should adhere to the BSAC code of conduct – 'Respect our Wrecks' (see Appendix VII).
4. Existing measures to minimise affects on water quality from diffuse pollution from agriculture and forestry, including General Binding Rules and good practice such as the Four Point Plan and Forests and Water Guidelines should be continued.
5. It is recommended that shellfish growers follow the ASSG Code of Good Practice (see section 3.2.5) in the operation of existing sites and when establishing new farms.
6. Development proposals for new or modification of existing sites should follow the SNH guidance, Marine Aquaculture and the Landscape: The siting and design of marine aquaculture developments in the landscape (Grant 2000).
7. All recreational users should follow the Scottish Marine Wildlife Watching Code to prevent disturbance to marine wildlife (see Appendix VII).
8. Divers are encouraged to employ a Delayed Surface Marker Buoy (DSMB) on dives where there is a need to manage the risk of injury from surface craft and other users. Boats supporting divers should display a diver flag, to alert other loch users to their presence.
9. Recreational users accessing the loch should follow the Scottish Outdoor Access Code (see Appendix VII), respect the property of local residents and businesses, not obstruct access to private residences or businesses when parking vehicles and not leave rubbish on the shore.
10. Recreational boat users, water-sports participants and boating businesses should make use of practical advice from the Green Blue Initiative (see Appendix VII) to ensure the sustainable operation and development of recreational boating. This should include adhering to guidance that discourages discharge of untreated sewage from vessels and encourages the use of holding tanks, onshore toilets and pump-out facilities in low tidal flushing areas and marinas.
11. Canoeists and kayakers accessing the marine waters of Loch Fyne should adhere to the Scottish Canoe Association's 'Paddlers Access Code' (see Appendix VII).

4. Policy Development Methodology

4.1 Introduction

Development policies have been developed to help guide future aquaculture development to appropriate areas by taking account of other activities and environmental sensitivities.

Policies have only been developed for aquaculture as this is an activity that now requires planning consent and therefore these policies will be used by Argyll and Bute Council as non-statutory supplementary planning guidance, and will be a material consideration in the determination of new applications for development. Policies have not been developed for other forms of marine and coastal development, but where constraints or opportunities relevant to other types of development were identified, they have been presented for each policy zone in Section 5.

Coastal developments that require planning consent from Argyll and Bute Council are currently guided by existing policies in the Argyll and Bute Development Plan (Structure & Local Plan) (Appendix I). This includes piers, harbours, slipways etc., and where there is potential for this type of development or a need has been identified by stakeholders this has been listed as a development opportunity, although these will require to be consistent with the relevant Development Plan policies.

There are no permitted development rights for aquaculture but there are some rights for industrial/storage uses, dependent on the exact nature of the operation. Permitted development rights are complex and would need to be looked at on a case by case basis, in consultation with the local planning officer.

4.2 Coastal Policy Zones

Coastal planning policy zones have been identified for Loch Fyne, based on landscape and coastal characteristics and other spatial information such as settlements, wildlife interests and marine activities. The marine and coastal area of Loch Fyne has been split into 17 coastal policy zones and 2 central loch zones. The location of these policy zones is shown in Figure 4.1.

The purpose of these policy zones is to break the loch into smaller areas to enable the collation, presentation and assessment of information gathered at a manageable scale.

4.3 Assessing Coastal Policy Zones

For each policy zone, two types of spatial information have been mapped. This information has been provided by stakeholders and regulators and where relevant, field assessments have been carried out to verify information.

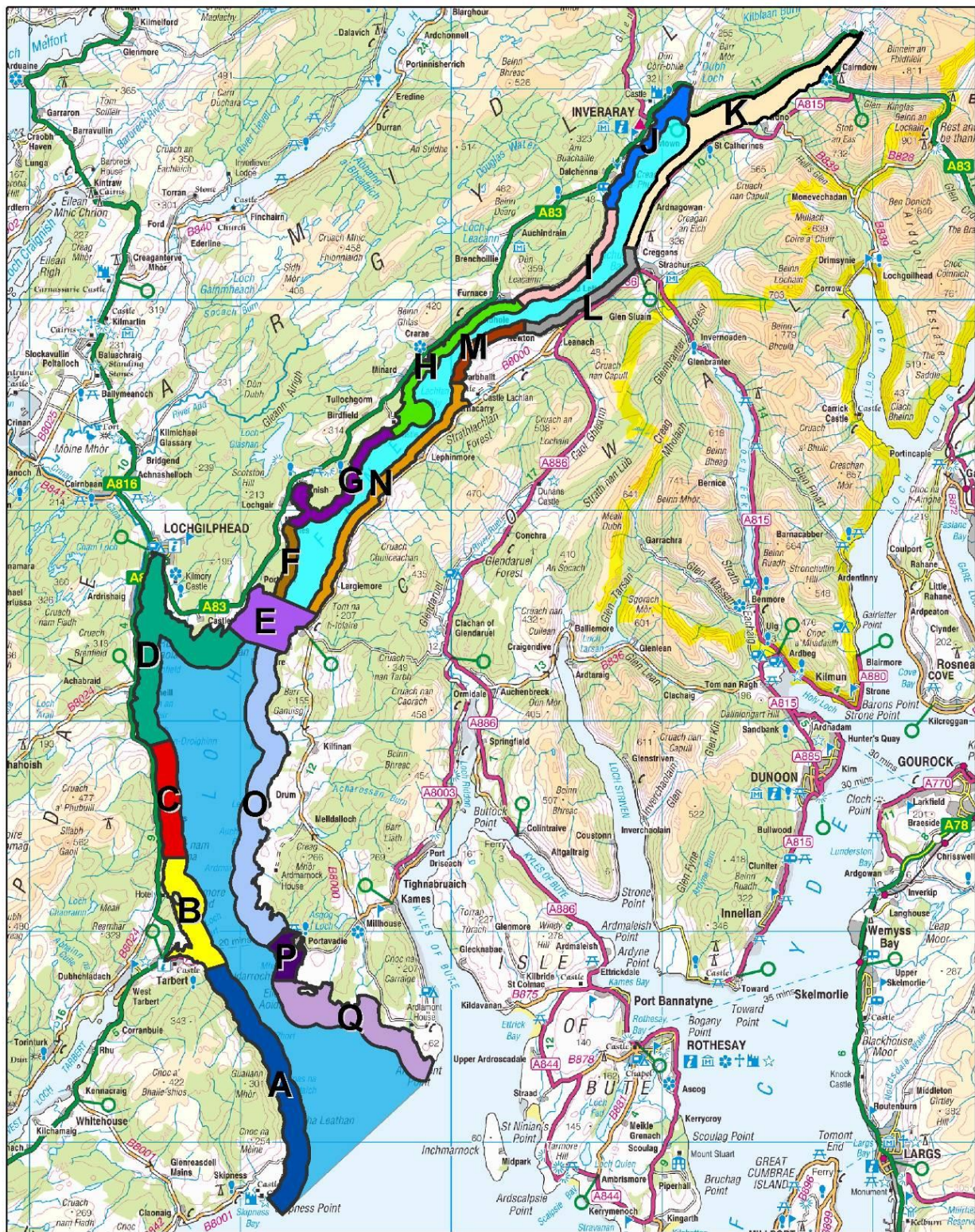
Static features and interests: MOD areas, submarine cables, moorings, existing aquaculture developments, dive sites, sensitive habitats, historic features, designated sites and landscape/seascape character.

Mobile features and interests: fishing activity, recreational angling, sailing and mobile marine species such as seals and cetaceans.

In addition, Argyll and Bute Council commissioned a landscape/seascape capacity analysis (Grant, A., 2007. Landscape/Seascape Capacity for Aquaculture: Loch Fyne. Final Report) to:

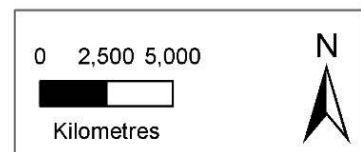
- Assess the landscape capacity of Loch Fyne to accommodate aquaculture development;
- Consider the implications of different types of fish farming technologies on the capacity to accommodate development.

The Landscape/Seascape Capacity analysis considers the capacity for development in relation to the surroundings. Consideration is given to the type of development and appropriate scales of development within given areas of the loch.



Legend

- LOWER LOCH FYNE
- UPPER LOCH FYNE



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Figure 4.1 Coastal Planning Policy Zones for Loch Fyne

The report offers guidance on:

- Whether or not the area can accommodate existing developments;
- Where there is any potential for consolidating or expanding existing structures;
- Where there is capacity in the landscape/seascape for additional structures, with advice on size and type;
- Where the coastal landscape is sensitive to aquaculture development and development should be discouraged on the grounds of landscape character and scenic quality.

The results from this work have been used as an additional layer of information, complementing spatial data already acquired for coastal planning policy zones for Loch Fyne, and the final report should be used in conjunction with this plan by local authority planners and other consultees when considering future aquaculture development in the loch. Strategic conclusions from this report can be found in Appendix VIII.

Although the landscape analysis focussed on the capacity for future aquaculture development, the assessment of sensitivity of different parts of the coastline has also informed the identification of opportunities and constraints for the future use of specific areas and the potential for other forms of marine and coastal development.

4.4 Developing Policies and Determination of Development Potential

In order to develop robust aquaculture policies and to determine development potential for aquaculture in each policy zone, a clear methodology has been developed. There are three components to this:

- 1) A marine spatial planning process has been carried out on the spatial information supplied by stakeholders and regulators. This identifies areas where there is currently no aquaculture development and where the development of aquaculture would not conflict with other activities or with areas identified as environmentally sensitive.
- 2) The compatibility of aquaculture development is then assessed against a number of criteria. These are based on the Argyll and Bute Development Plan policy LPAQUA1 (see Appendix VI), and include visual amenity, wildlife interests, recreational interests, navigation, historical and archaeological interests and any conservation designations.
- 3) The results of the landscape/seascape capacity analysis have then been used to consider the capacity for aquaculture development in relation to the surroundings. Consideration has been given to the type of development and appropriate scales of development within given areas of the loch.

By following this process, opportunities and constraints to development are identified, which inform the development policies for each zone. This ensures that the policies are developed to help guide future aquaculture development to appropriate areas.

The aquaculture policies fall into 3 categories:

- **Finfish Development Policies** - relate to development of new or modification of existing marine salmon farms and farms growing other marine finfish such as cod, haddock or halibut.
- **Shellfish Development Policies** - relate to development of new or modification of existing mussel, scallop or oyster farms.
- **Onshore Aquaculture-Related Development Policies** - relate to the development of new infrastructure or modification of existing infrastructure required for aquaculture activity, including shore-bases and hatcheries.

These policies take account of all information gathered for each policy zone and a justification is provided for each policy. Where it is clear at a strategic level that there is likely to be a significant adverse effect the development policy will be a presumption against development. In cases where it is felt impacts could be mitigated or it is not possible to determine the significance of impacts at a

strategic level, policies are a presumption in favour, but constraints and supplementary guidance provides a steer on what potential constraints need to be overcome. Where a presumption against development has been identified, development policies for aquaculture do not preclude the submission of applications for shellfish or finfish development in these areas.

If policies are in favour of new development or expansion of existing sites, then guidance on the location and scale of potential development is given, based on the capacity of the landscape/seascape sensitivity and other interests. Further information on the scenarios used to determine scale can be found in Appendix X.

As development policies for aquaculture are based on the potential for new development in relation to the current level of development, the relinquishment of existing sites in the future may offer new potential for development. It is not possible to account for all potential future development scenarios and a view is given in each policy zone on whether a particular type of development i.e. finfish, mussel, oyster, scallop, would be appropriate, should existing aquaculture sites be relinquished. In these cases, guidance on the location or scale is not possible.