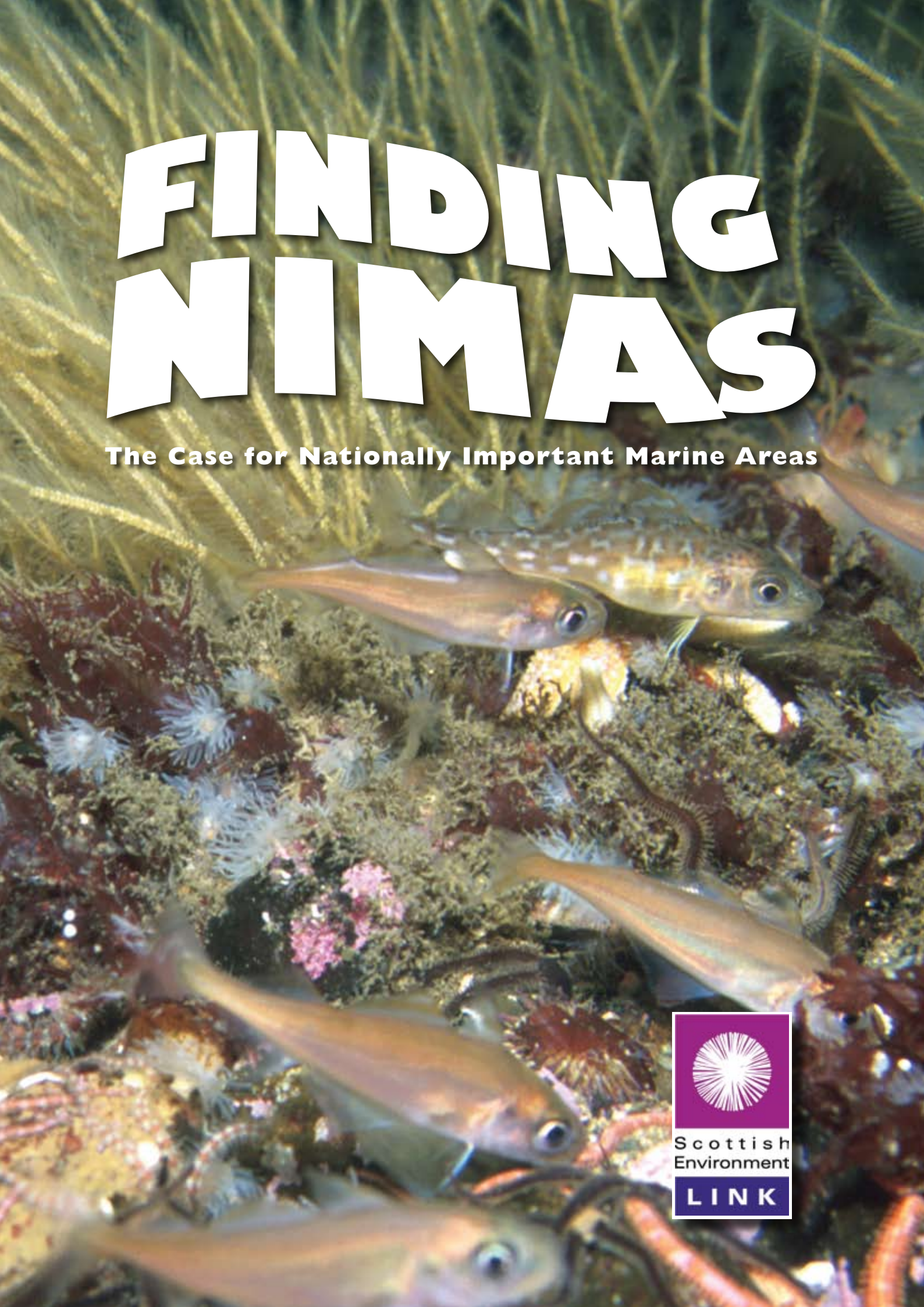
FINDING NIMAS

The Case for Nationally Important Marine Areas



Scottish Environment LINK

This report was written by Calum Duncan and Becky Boyd, based on work commissioned from Christine Howson, for the Scottish Environment LINK Marine Task Force. The Task Force comprises the following organizations:

Hebridean Whale and Dolphin Trust
Marine Conservation Society
National Trust for Scotland
RSPB Scotland
Scottish Wildlife Trust
Whale and Dolphin Conservation Society
WWF Scotland

LINK is grateful to the Esmée Fairbairn Foundation, The Tubney Charitable Trust, Lisbet Rausing and Peter Baldwin for funding to both commission Christine Howson and design and publish this report.

For further information contact
LINK Marine Task Force Convenor
and MCS Scottish Conservation Manager
Calum Duncan (0131 226 6360)

Published by Scottish Environment LINK,
December 2007
2 Grosvenor House, Shore Road, Perth, PH2 8BD

Design by Ian Kirkwood Design
www.ik-design.co.uk
Printed by Kall Kwik
Text and cover printed on Revive Silk

www.scotlink.org

www.savescottishseas.org

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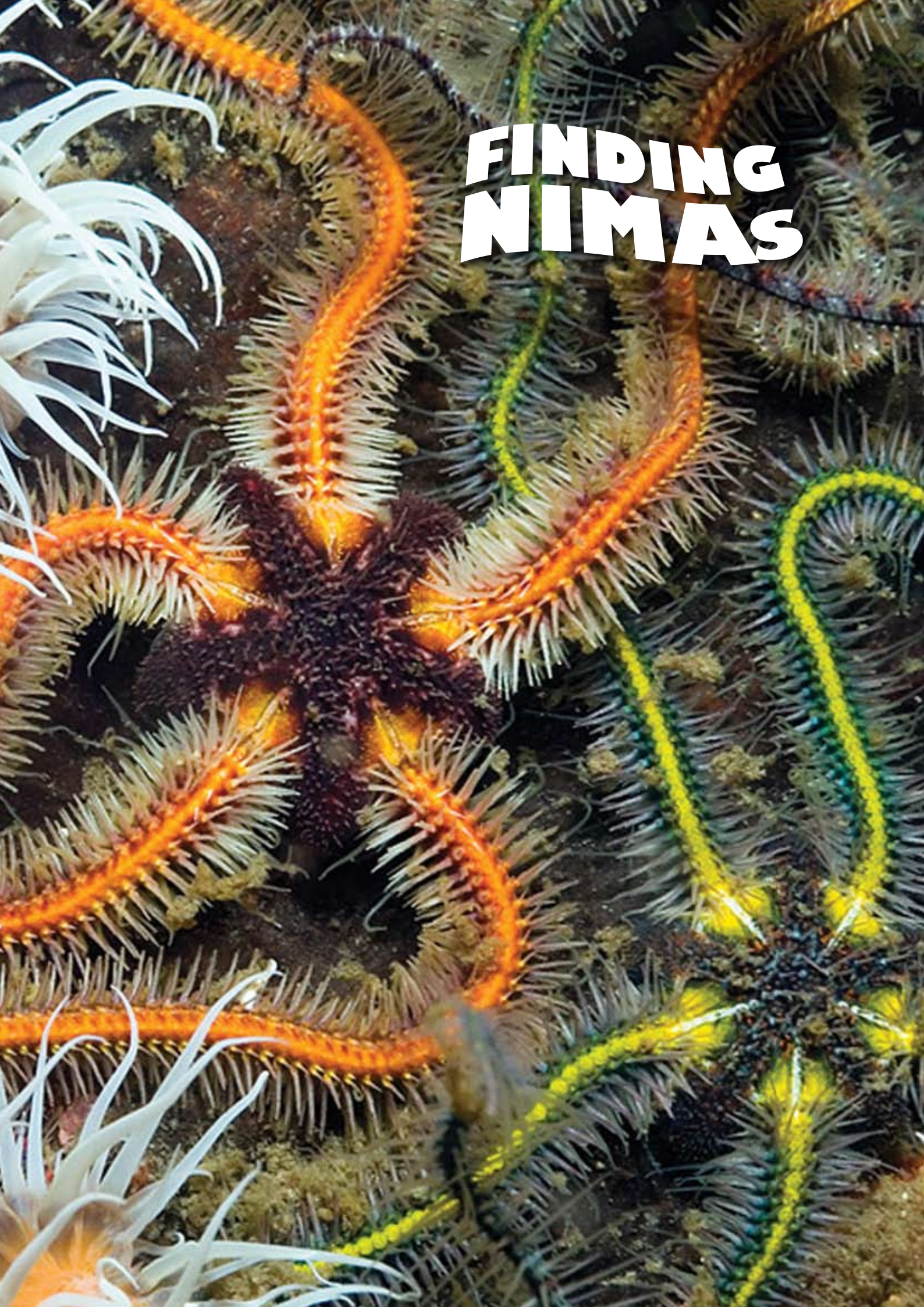
Front cover: *Young cod and poor cod on flameshell reef*
© Sue Scott
Inside front cover: *Common Brittlestars*
© Paul Kay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NIMAs

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Summary

SCOTLAND'S coasts and seas are amongst the most diverse in the world. Our marine wildlife is worth protecting in its own right, and is also the keystone for economic activities like fishing and tourism. However, human activities are destroying Scotland's unique and beautiful marine environment, and with it the natural resources we all rely on.

Protecting areas of sea, where key habitats and species are allowed to flourish, and human activities may be restricted to varying degrees, can play an important role in improving the health of the marine environment. Currently less than 0.001% of UK waters is fully protected from damaging activities, and less than 1% has any kind of protection.

The existing legal tools for protecting areas of sea have serious shortcomings. Only five marine species and eight habitat types can be protected with European marine sites, and it can be difficult to restrict activities that are damaging the sites as a whole.

Scotland needs a new, more comprehensive network of Nationally Important Marine Areas (NIMAs) for several reasons:

- **to protect nationally important species like common skate, basking shark and black guillemot; habitats like flameshell reefs, deep burrowed mud and seagrass beds and marine landscape scale features like sea lochs, that are not adequately protected**
- **to meet international commitments , including that for an 'ecologically coherent network of well-managed marine protected areas'**
- **to help regenerate our seas, bolstering their productivity and resilience and ensuring that they can continue to support economic activity and social well-being.**

This network would consist of areas:

- **representative of Scotland's key marine habitats**
- **of exceptional biodiversity**
- **to protect nationally important marine wildlife**
- **to protect feeding, spawning, mating and migration sites**

It would complement the Natura 2000 suite of sites designated under the *EU Birds and Habitats Directives*. Each area would be chosen according to ecological criteria and managed according to its individual needs. Some areas might make little difference to human activities taking place in them, while others might need more protection from damage.

Nationally Important Marine Areas will work best as part of a complete 'toolbox' of improved marine planning and management, as recommended in March 2007 by the Ministerial Advisory Group on the Marine and Coastal Strategy (AGMACS). We believe a new system of NIMAs must include seven important elements:

1. sites are selected by agreed scientific criteria alone and managed according to ecological need

2. socio-economic factors may play a role in management decisions and when choosing between similar alternative sites but not during the initial scientific site selection process

3. there must be tools to monitor and enforce management according to the ecological needs of the site

4. expert ecological advice should play a key role in all stages of criteria setting, site selection and management

5. sites should be in place to meet Scotland's international obligations

6. the network should operate within a new marine spatial planning system designed to deliver long-term sustainable management

7. there should be local involvement, where possible and appropriate, in site management

The LINK Marine Task Force urges the Scottish Government to:

- **Develop a Scottish Marine Bill with the environment at its heart, complementing a UK Marine Bill**
- **Establish a network of NIMAs, selected and managed on sound ecological grounds**
- **Establish through the Scottish Marine Bill a statutory system of Marine Spatial Planning that furthers the protection, restoration, enhancement and sustainable use of the sea and its resources**
- **Develop a Scottish list of Nationally Important Marine Features to help inform selection of NIMAs**

Why we need better protection for Scotland's marine wildlife

SCOTLAND'S coasts and seas are amongst the most diverse in the world, supporting around half of our biodiversity, much of which is of national and international importance. We all rely on this biodiversity – as well as being worth protecting in its own right, it forms the irreplaceable bedrock of human economic activities. Now there is scientific evidence that human activities, which treat the sea as a 'common resource', are altering the web of life that the sea supports. Like a forest where we have cut down all the trees and wonder why there is neither firewood nor birds, the sea is becoming less and less able to provide us with the fish and other natural resources our economy and well-being depend on.

It doesn't have to be like this – if we improve the overall management of the sea now it will be better able to recover its health and productivity, and we can help to ensure that we can fish and watch dolphins and other wildlife in future. Nationally Important Marine Areas (NIMAs) are part of this solution.

The engine house for Scotland's economy

- **At over £14 billion[1], over 80% of the value of Scotland's ecosystem services (the vital functions that support life on earth including flows of material and energy, nutrient cycling, food production etc.) derives from its estuaries and territorial waters.**
- **Organisms in the sea make it act as a giant 'carbon sponge', soaking up carbon dioxide from the atmosphere.**
- **Over 60% of the UK fishing catch, with a landings value in 2006 of £370m, comes from Scottish vessels.**
- **Scotland accounts for 90% of the UK's farmed fish, with a farm gate value of £300m.**
- **Marine wildlife tourism is a developing industry, directly providing over 2,500 jobs and earning £57m revenue a year[2].**
- **The marine-based economy provides vital support to Scotland's wider community. 70% of Scotland's population lives within 10km of the coast, and a quarter of Scottish businesses, accounting for 10% of Scottish turnover and 20% of employment, are within 1km of the coast.**

© Paul Kay

Sir David Attenborough

"As an island nation, I find it astonishing that we have protected less than a thousandth of one percent of our seas from fishing and all damaging activities."

1. This compares with Scottish GDP of £64 billion in 1999. Williams et al (2003) *The Value of Scotland's ecosystem services and natural capital.* European Environment Volume 13, Issue 2, pp.67-78
2. Figures from Scottish Executive (2005) *Seas the Opportunity - A strategy for the long-term sustainability of Scotland's Coasts and Seas.*
3. Hiscock, K., Sewell, J. & Oakley, J. (2005) Marine Health Check 2005. A report to gauge the health of the UK's sea life. WWF-UK.
Hall-Spencer, J. M. and Moore, P. G. (2000). *Limaria hians* (Mollusca : Limacea): a neglected reef-forming keystone species.
Aquatic Conservation-Marine and Freshwater Ecosystems 10, 267-277
4. http://www.ices.dk/reports/ACE/2002/SGCOR02.pdf
5. In Loch Creran SAC many square metres of seabed, including a large *Serpula vermicularis* reef, have been smothered by mussel shells (*pers. comm*).
6. http://www.rspb.org.uk/news/details.asp?id=tcm:9-165514
7. http://www.scotland.gov.uk/Topics/SustainableDevelopment/measuring-progress/Natural-heritage/Marine
8. Marine Conservation Society (2007) *Beachwatch Report 2006*

FINDING NIMAS

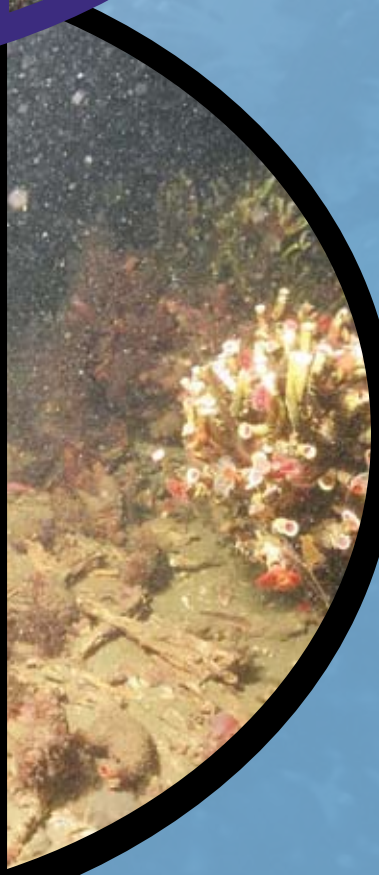
World-class sea life

- seabird colonies supporting over 5 million breeding seabirds, amounting to nearly half of all of the seabirds in the European Union, including the largest northern gannet colony in the world at St Kilda
- 77% of the European Union and 36% of the world population of grey seal
- the world's most northerly resident population of bottlenose dolphin in the Moray Firth, along with 28 other species of whale and dolphin
- most of the UK's reported sightings of the basking shark, the world's second largest fish
- Scottish sea lochs – a unique feature in the European Union
- Most of the UK's maerl beds, horse mussel reefs, flameshell reefs, northern sea fan communities and coldwater coral communities (particularly *Lophelia pertusa*)

© Paul Kay

Destroying the engine house

- many marine species and habitats, including common skate, flameshell reefs, maerl beds and seagrass beds, are in decline[3]
- coldwater corals are being permanently damaged[4]
- other unique habitats are being damaged, even in existing protected areas such as Loch Creran[5]
- Seabird colonies in the north and west are failing due to a shortage of food[6]
- 14 of 21 Scottish fish stocks, including cod and Atlantic salmon, are fished beyond sustainable limits[7]
- litter on Scotland's beaches is almost double that of ten years ago[8]



Marine Protected Areas in Scotland

SITE-BASED protection, often referred to as Marine Protected Areas (MPAs), can play an important role in improving the health of our seas as part of a comprehensive 'toolbox' of better marine planning. MPAs are areas where key habitats and species are allowed to flourish, and human activities may be restricted to varying degrees according to the needs of the environment. They are an established tool and their benefits to wildlife, to people and to natural resources are well documented.[9]

International commitments

The Scottish and UK Governments have international commitments under the Oslo-Paris (OSPAR) Convention and the World Summit on Sustainable Development (WSSD) to create 'an ecologically-coherent network of well-managed Marine Protected Areas,[10] to 'halt the decline of biodiversity across the European Union '[11] and to 'establish marine protected areas consistent with international law and based on scientific information, including representative networks, by 2012'.[12]

It is widely acknowledged that these commitments cannot be met by European designations alone, and that a new tool for site protection is required. It is also recognised that the OSPAR Convention operates at regional sea scale and is unlikely to provide for site protection for the 'representative networks' required by the WSSD or for the full range of marine wildlife nationally important to Scotland.[13] The UK Government is proposing the designation of Marine Conservation Zones for a range of marine wildlife for England and Wales. Marine nature conservation is devolved to the Scottish Government within 12 nautical miles, so a new suite of Scottish sites is needed to meet these commitments.

The Small Isles are important for sea life

Dame Ellen Macarthur
ROUND-THE-WORLD YACHTSWOMAN

"It goes without saying how important it is that everything is done to save our oceans and their inhabitants."

9. Kelleher, G. (1999). *Guidelines for Marine Protected Areas*. IUCN, Gland, Switzerland and Cambridge, UK. xxiv +107pp.
10. OSPAR Commission (2003). OSPAR Recommendation 2003/3 on a Network of Marine Protected Areas. Meeting of the OSPAR Commission, Bremen June 2003, Annex 9.
11. European Commission (2006). Communication from the Commission on Halting the Loss of Biodiversity –and Beyond.
12. United Nations 2002. Plan of Implementation of the World Summit on Sustainable Development. In the Report of the World Summit on Sustainable Development, Johannesburg, South Africa.
13. Department for Environment Food and Rural Affairs (2007) A Sea Change – A Marine Bill White Paper. 6.14 *'current measures are unable to fully deliver our biodiversity objectives.'*

Basking shark tangled in rope

Why is existing protection failing?

Many people assume that Scotland's seas are well protected, but this is far from the case. In the UK, less than 0.001% of the sea is fully protected from damage and less than 1% has any level of protection.

The existing legal tools for protecting areas of sea are limited both in terms of the range of wildlife they can protect and in their success at providing protection:

Marine Nature Reserves

There are no Marine Nature Reserves (MNRs) in Scotland, and the Government has acknowledged that the legal tool underpinning MNRs does not have the legal force to succeed and should be replaced. There is no statutory requirement to establish a network of reserves, or to protect them using available powers. Management relies entirely on voluntary measures and there are no powers to require other sea users to comply with plans to protect the MNR.

European Marine Sites

There are 34 marine sites in Scotland designated under the European Habitats Directive but they are confined to wildlife of European importance. Only five marine species and eight types of habitat can be considered for site protection in Scotland and these must meet European thresholds of importance.[14]

There are acknowledged difficulties in managing these sites effectively. Management is primarily based on voluntary agreement, but where this fails control of damaging activities relies on the co-ordinated action of agencies and government departments, which is not always present. There is no requirement to prepare a management plan for these sites. Where there is no plan the sites effectively have no protection. Dredging and other activities that can damage the site as a whole may still take place where they do not affect the particular site interests.

There is a requirement to demonstrate that damage has taken place before protective measures can be put in place, so the *Precautionary Principle* cannot be applied. Infringement proceedings take place at European level, and the lack of national enforcement powers can slow action to control damage.

14. European Habitats Directive Annex I habitats in UK waters that can be considered for protection– estuaries, lagoons, large shallow inlets or bays, submerged or partly submerged sea caves, sandbanks slightly covered by water all the time, mudflats and sandflats not covered by water at low tide, reefs and submarine structures made by leaking gases. Annex II marine species that can be considered for site protection – grey seal, common seal, bottlenose dolphin, harbour porpoise and otter.
Marine Special Protection Areas (SPAs) for seabird feeding and loafing areas have yet to be designated in Scotland under the European Birds Directive, although a number of terrestrial SPAs exist to protect seabird nesting sites.

European seabird sites

The European Birds Directive allows for certain birds listed on Annex I or regularly occurring migrants, to be protected within Special Protection Areas (SPAs). This covers terrestrial breeding colonies and estuaries, but not important areas of sea. Non-migratory birds that do not appear on Annex I, like the black guillemot, cannot be protected.

Biodiversity Action Planning (BAP)

Some marine habitats and species are included on the 'Scottish Biodiversity List', and there is a duty on public bodies and office holders under the Nature Conservation (Scotland) Act to 'further the conservation of biodiversity'.[15] This duty does not, however, give direct legal protection to listed biodiversity or any site protection mechanism, so its conservation relies on voluntary effort and available resources. While much effort and resources have been dedicated to the BAP process, this lack of legal 'teeth' has prevented it from making a real difference to marine wildlife protection.

Black Guillemot or 'Tystie'

Coastal and Marine National Park

Legislation exists in Scotland to create a Coastal and Marine National Park (CMNP) in Scotland. This was designed primarily to promote the sustainable development of an area of sea and does not provide additional legal tools to protect or manage marine wildlife. There are currently no CMNPs in the UK.

Case Study

Lochs Duich and Loch Alsh

Designated for its important reefs, the site boundaries of Lochs Duich, Long and Alsh European Marine Site include only the edges of the lochs and the tidal narrows where the reefs are found. Trawling for Scottish langoustine in the muddy basins and dredging for scallops on gravel areas continue by agreement just offshore, despite these activities respectively threatening nationally important species such as tall sea pens (*Funiculina quadrangularis*) and fan mussels (*Atrina fragilis*). Since deep muds with sea pens and fan mussels are not listed European features, the site cannot give them any protection, even on a voluntary basis.

Loch Duich

15. '*A List of Species and Habitats considered to be of Principal Importance for the purpose of Biodiversity Conservation in Scotland*' 2005. Nature Conservation (Scotland) Act http://www.opsi.gov.uk/legislation/scotland/acts2004/asp_20040006_en_2#pt1-l1g1

FINDING NIMAs

Nationally Important Marine Areas (NIMAs)

Protecting Scotland's national marine treasures

EXISTING site protection measures leave a significant gap in the range of wildlife that can be protected, and there are issues in relation to how effectively European sites are managed. Scotland has over 8000 marine vertebrate, invertebrate and plant species, and some 370 identified marine habitats,[16] of which only a tiny fraction can enjoy even limited protection. Some of Scotland's most important wildlife, the marine equivalent of our golden eagles, red squirrels and Scottish primroses, continues to decline.

The term **Nationally Important Marine Area (NIMA)**, was used in 2006 by the Marine Nature Conservation Workstream of the then Scottish Executive's Advisory Group on Marine and Coastal Strategy (AGMACS). It is a convenient term to describe all protected areas of national importance. New NIMAs are most urgently required to plug the gaps in existing protection and secure the future of many unprotected species and habitats. Unfortunately there has been no commitment by the Scottish Government to the creation of such areas.

Common skate being tagged for release

Case Study

Common Skate (*Raja batis*)

Now far from common, the common skate is in severe decline, largely due to targeted and non-targeted fishing.[17] It is the largest member of the skate and ray family in European waters, a spectacular animal that can reach almost 3 metres in length and live for up to a century. Locations where common skate gather to reproduce and feed should be protected to aid in population recovery.

LINK believes that the current Scottish Government must create a more comprehensive network of Nationally Important Marine Areas for wildlife protection, to help Scotland meet its international commitments, and to ensure that Scotland's seas thrive and continue to support economic activity.

This network would consist of samples of nationally important habitats, species, and marine landscapes, to complement existing European sites. Each area would be chosen according to scientific criteria and managed according to its individual needs. Some areas might make very little difference to human activities taking place in them, while others might need more protection from damage. While the primary aim of NIMAs would be to protect Scotland's national marine wildlife, there are likely to be indirect economic benefits from allowing the marine ecosystem to recover.

Features of cultural heritage, such as wrecks and drowned landscapes, and geological importance also require better site-based protection, although this is beyond the scope of this report.

16. 'See JNCC website: http://www.jncc.gov.uk/marine/biotopes/hierarchy.aspx
17. WWF and Marine Biological Association (2007) *Marine Biodiversity Hotspots*

Maerl beds are important for juvenile fish and shellfish

Case Study

Maerl Beds

Maerl is the free-living form of some calcified red sea-weeds, slowly growing as unattached coral-like twiglets that over centuries can form deep beds in tide-swept areas. Supporting over 600 species, maerl is of great conservation importance in its own right. However, it also provides nursery grounds for some commercial species of fish and shellfish, where they can feed or shelter from predators.[18] For example, juvenile queen scallops are found in greater numbers on maerl than other habitats[19] and indeed they consistently prefer settling on live pristine maerl than on impacted dead maerl, sand or gravel.[20] Proper site protection for maerl beds would therefore benefit both biodiversity and inshore fisheries.

Tom Brock

CHIEF EXECUTIVE, SCOTTISH SEABIRD CENTRE

"Scotland is now established as Europe's leading wildlife tourism destination worth over £65million to the Scottish economy and supporting over 2,000 jobs. But all this is under threat as seabird populations crash due to a lack of food. A Marine Act for Scotland will help to save our seabirds."

18. Barbera, C., Bordehore, C., Borg, J. A., Glemarec, M., Grall, J., Hall-Spencer, J. M., De la Huz, C., Lanfranco, E., Lastra, M., Moore, P. G. et al. (2003). Conservation and management of northeast Atlantic and Mediterranean maerl beds. *Aquatic Conservation-Marine and Freshwater Ecosystems* 13, S65-S76

19. Kamenos, N. A., Moore, P. G. and Hall-Spencer, J. M. (2004a). Nursery-area function of maerl grounds for juvenile queen scallops *Aequipecten opercularis* and other invertebrates. Marine Ecology-Progress Series 274, 183-189.

20. Kamenos, N. A., Moore, P. G. and Hall-Spencer, J. M. (2004b). Attachment of the juvenile queen scallop (*Aequipecten opercularis* (L.)) to Maerl in mesocosm conditions; juvenile habitat selection. *Journal of Experimental Marine Biology and Ecology* 306, 139-155.

Which Scottish marine wildlife do we need to protect?

THESE case studies illustrate a selection of the species, habitats and landscapes of Scottish importance that urgently need improved protection and would be likely to benefit from being cared for within a network of NIMAs.[21] Work is ongoing to list marine features of national importance or of value to biodiversity, and these lists could usefully inform improvements in marine wildlife protection.[22]

In addition to the marine features in these case studies, there are other habitats, such as horsemussel reefs, maerl beds, native oyster beds and sea grass beds, which although receiving protection within some existing European marine sites, would benefit from NIMA protection at sites where they occur at thresholds below European importance or cannot be included under EU site criteria.

Spiny lobster
(Palinurus elephas)

The west coast of Scotland and the northern and western isles are a stronghold for the UK population of spiny lobster (known as crayfish in Scotland). It is considered threatened and is believed to be declining, largely as a result of both targeted fishing and being caught as by-catch. Divers cite records of numerous lobsters at sites where none or few are now found. Evidence from other temperate countries such as New Zealand[23] suggests that when protected, spiny lobster numbers can recover well, and go on to replenish neighbouring populations outside the boundaries of a protected area.

The species is now a Biodiversity Action Plan (BAP) species, and is recognised in the UK Marine Bill White Paper as of regional significance, but this does not confer legal protection.

Need for NIMA:
Protection from fishing on important reefs would allow key populations to recover and overspill into surrounding areas.

Arachnanthus sarsi
(a burrowing anemone)

Within the UK this spectacular yet nationally rare burrowing anemone has been recorded from only a handful of sites in Scotland, including the Firth of Lorn, Isle of Coll, Isle of Canna and in Shetland. It lives in a parchment-like tube in mud, sand or shelly mud sediment and can grow up to 20cm in height when expanded. It arranges its tentacles beautifully - the inner tentacles point inwards and upwards to form a cone. It is easily destroyed by mobile fishing gear or other sea bed disturbance.

It has recently been recognised as a BAP species, but does not enjoy specific protection.

Need for NIMA:
As a nationally rare BAP species, protection of areas of its habitat would ensure the continued existence of this beautiful but rare and delicate animal.

21. These case studies represent an illustrative selection of wildlife. While many of these features are important for the functioning of marine ecosystems, specific consideration of 'ecosystem functions', an important aspect of conservation management, is beyond the scope of this report.
22. The UK Government has recently published the revised UK Biodiversity Action Plan list, including marine features. In parallel to this process, a list of Nationally Important Marine Features (NIMF) is being developed. These are marine species, habitats, landscapes or cultural features that have a high proportion of global or European occurrence within the UK or are rare, threatened or declining. Both the NIMF and UK BAP lists will be used to augment the *List of Species and Habitats considered to be of Principal Importance for the purpose of Biodiversity Conservation in Scotland*, the Scottish biodiversity list referred to in the Nature Conservation (Scotland) Act.
23. Kelly, S., Scott, D., MacDiarmid, A. B. and Babcock, R. C. (2000). Spiny lobster, *Jasus edwardsii*, recovery in New Zealand marine reserves. *Biological Conservation* 92, 359-369


© Calum Duncan/MCS

Common skate
(Raja batis)

Reaching almost 3m in length, the spectacular Common Skate is the largest skate or ray in UK waters. Once common, it is now listed as Endangered on the World Conservation Union (IUCN) Red List. Numbers are believed to be extremely low in areas where they were once abundant. As with all sharks and rays, it produces very few young and has suffered dramatic decline due to targeted fishing and being caught as by-catch.

The Common Skate is a BAP species, and its Action Plan recommends the creation of five refuge areas to help protect it. This has not yet happened. It does not currently enjoy any legal protection, although scientists recommend that it should be listed under Schedule 5 of the Wildlife and Countryside Act (1981).

Need for NIMA:
to create statutory underpinning for Skate 'refuges', to provide proper protection for key spawning and feeding areas, and to help halt severe decline.


© Colin Speedie

Basking Shark
(Cetorhinus maximus)

This slow-growing gentle giant is the world's second largest fish, growing to 10m or more in length. With a gestation period of 1-3 years, producing very few large pups which take 12-20 years to reach maturity, it is no wonder this species is vulnerable to disturbance. Basking shark numbers in Scottish waters have nonetheless increased by 65% between 2001 and 2004,[24] perhaps owing to changes in distribution of their main food, shrimp-like zooplankton called copepods. The last Scottish basking shark fishery closed in the Clyde in 1994 and populations of this slow-growing, long-lived species may also be showing some local recovery as a result.

The Basking Shark was added to the Wildlife and Countryside Act (WCA) in 1998, and 'reckless disturbance or damage' is now a criminal offence. This legal protection ends at 12 nautical miles (nm) from shore, so these shark can still be killed with impunity in offshore UK waters. Extension and enforcement of the measures under the WCA to 200nm would therefore be of great benefit.

Need for NIMA:
Although UK population is stable, protection of important breeding and nursery areas would help ensure shark populations flourish in Scottish waters, increasing their international importance.


© RSPB Images

Black Guillemot
(Cepphus grylle)

This striking black and white auk with red feet is typical of the larger sea lochs of western Scotland, and the northern and western isles, where it feeds on fish and crustacea. Almost all of the UK and half the European Union's black guillemots are found in Scotland, where they are known as 'Tysties'. Its distribution is determined by the availability of suitable nest cavities safe from land predators such as rats, mink, stoats and otters.

Birds have legal protection while at their nests, and Special Areas of Protection can be designated to protect a few species (listed as rare and vulnerable on Annex I of the Birds Directive, or that are regularly occurring migratory species). Despite being of Scottish, UK and EU significance, black guillemot feeding or breeding habitat cannot be protected.

Need for NIMA:
to protect important areas at sea for this and other seabirds either non-migrating or not listed on Annex I of the EU Birds Directive.

24. Doyle, J.I. *et al* (2005) MCS Basking Shark Watch Report 1987-2004

Habitats

Harbour Porpoise
(Phocoena phocoena)

The smallest and most numerous and widely distributed of UK cetaceans, the harbour porpoise can live for up to 20 years. In the UK its highest densities are found in south west Wales and off the west coast of Scotland. It is vulnerable to many human-induced threats, including noise pollution and fishing activity, both being caught as by-catch and suffering declines in prey-fish stocks. The estimated by-catch of harbour porpoise in the North Sea declined from around 1000 in 1995 to 600 in 2000, probably as a result of reduced fishing effort, but by-catch remains a significant cause of mortality.[25]

The harbour porpoise is protected from reckless or intentional damage and disturbance by the Wildlife and Countryside Act. Despite being listed on 23 EU Directives, including the EU Habitats Directive, no marine Special Areas of Conservation (EU sites) for harbour porpoise have yet been established in UK waters.

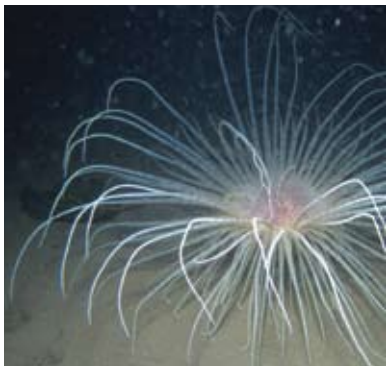
Need for NIMA:
to protect critical areas for this species.

Flameshell Reefs
(Limaria hians)

These spectacular molluscs create 'nests' out of stones, gravel and fragments of maerl using their sticky 'byssus' threads. These nests can form a reef over muds and sands that can support over 250 species of plant and animal, including sponges, worms, other molluscs, crustaceans and even attached kelp communities.[26] The west of Scotland supports most of the UK's Flameshell reefs, and good examples are found in the narrows of sea lochs such as Loch Fyne, Loch Sunart and Loch Carron. Being delicate structures, they are very vulnerable to seabed disturbance from, for example, mobile fishing gear and mooring chains. Records prior to the 1970s in the Clyde show that this species was once widespread, but that it has disappeared from previous strongholds.

Flameshell reefs were recently made a BAP habitat but receive no protection under existing legislation, as they are not considered to meet EU criteria for 'biogenic reefs'.

Need for NIMA:
to halt the decline of a fragile seabed habitat that is important for marine biodiversity.



Deep burrowed muds with sea pens and/or fireworks anemones

Often found in the sheltered deep muddy basins of fjordic sea lochs, this important yet declining habitat is home to 'sea pens', including the spectacular tall sea pen (*Funiculina quadrangularis*, itself a BAP species), and the dramatic fireworks anemones (*Pachycerianthus multiplacatus*). The arctic relict sea squirt *Styela gelatinosa* is known from only one such mud basin in Loch Goil. Also found in such muds are commercially valuable Scottish langoustines (*Nephrops norvegicus*), which are targeted by mobile trawl gear that can damage the sea pens and anemones.

Deep mud habitats are a BAP habitat. They are found within the boundaries of some marine Special Areas of Conservation selected as 'large shallow inlets and bays'. As the UK interpretation of 'shallow' is an average depth of less than 30m, many of the deeper parts of sea loch basins where these fragile species live cannot be protected.

Need for NIMA:
to give proper protection to examples of this fragile seabed habitat, help halt its decline and contribute to an ecologically-coherent network of marine protected areas.

25. Department for Environment, Food and Rural Affairs Biodiversity Indicators: M6 levels of cetacean bycatch in UK waters, www.defra.gov.uk/wildlifecountryside/ewd/biostrat/html/m6.htm
26. Hall-Spencer, J. M. and Moore, P. G. (2000). *Limaria hians* (*Mollusca : Limacea*): a neglected reef-forming keystone species. *Aquatic Conservation-Marine and Freshwater Ecosystems* 10, 267-277

Tide-swept channels

These are strong tidal streams passing through a constriction in the coastline, such as in sea loch narrows or between islands. Scotland has some of the best examples of such habitats in Europe. They create characteristically rich communities of seaweeds and/or filter-feeding animals, ranging from horsemussel reefs and bedrock covered in anemone and sea fir to maerl beds and rich kelp and sea oak communities. These channels are likely to be under increasing threat from tidal energy or causeway developments.

Tide-swept channels are a BAP habitat but have no legal protection, unless they happen to lie within an SAC designated under rock or biogenic reef criteria.

Need for NIMA:
to give proper protection to a potentially threatened BAP seabed habitat and contribute to a representative and ecologically coherent network of marine protected areas.

Northern sea fan *(Swiftia pallida)* and sponge communities on subtidal rocky habitats

The Northern sea fan is a flagship species for Scotland. It is found on the west coast, in biodiverse, moderately tideswept deeper reef habitats that also support deepwater sponges, football sea squirts and Celtic featherstars. These communities are very fragile, slow growing and sensitive to disturbance, and cannot withstand or recover from damage, for example from mobile fishing gear. A recent report from Loch Maddy suggests that some *Swiftia* populations may be in decline within the SAC.[27] Northern sea fans are host to the rare sea fan anemone, which is also recorded on its southern counterpart, the pink sea fan, in southwest England. Limited available information suggests that densities of sea fan anemones are higher in northern sea fan communities.

Unlike the pink sea fan, *Swiftia pallida* is not listed as a protected species on the WCA schedule. It has recently been listed both as a BAP species and within the "fragile sponge and anthozoan communities on subtidal rock" BAP habitat, although this does not confer legal protection.

Need for NIMA:
protection of nationally important sites for *Swiftia* communities from potential damage and to help prevent further decline.

Sea lochs

Scottish sea lochs are unique within Europe. Reaching far inland, these arms of the sea experience a huge range of conditions, creating a dense patchwork of habitats: at least 90 habitats have been recorded in Scottish sea lochs including records for over 1700 species of marine invertebrates and seaweeds. In a recent study, of all UK inshore marine landscape features, sea lochs were identified as the most taxonomically distinct.[28]

Fjordic sea lochs are characterised by deep basins carved by glaciers out of mountainous bedrock during the ice age with sills at the entrance and are different in character to those in Norway. Fjardic sea lochs are a result of glacial ice sheets moving slowly over low-lying land, leaving a landscape of harder rock knolls and shallow lochans subsequently flooded by rising seas. A wealth of nationally important features including maerl beds, horsemussel reefs, flameshell reefs, sheltered rock reef communities, deep muds with seapens and fireworks anmones, tidal rapids and the free-living seaweed crofter's wig (*Ascophyllum nodosum* ecad *mackaii*) are all found in sea lochs.

Some sea lochs have been designated as marine SACs under the aegis of other features, for example under 'sheltered reefs' (Lochs Duich, Long and Alsh), 'biogenic reefs' (Loch Creran), 'sandbanks and large shallow inlets and bay's (Loch Maddy and Loch Laxford) or 'coastal lagoons' (Loch

27. Moore, C.G., Saunders, G., Mair, J.M. and Lyndon, A.R. (2006). The inauguration of site condition monitoring of marine features of Loch Maddy Special Area of Conservation. *Scottish Natural Heritage Commissioned Report No. 152* (ROAME No. F02AA409).
28. WWF and Marine Biological Association (2007) Marine Biodiversity Hotspots

Eport). Some typical individual sea loch features such as deep burrowed muds are not directly protected anywhere, including at existing SACs such as Loch Sunart and Lochs Duich, Long and Alsh. Of all marine landscape types, sea lochs are some of the most vulnerable to human activity[29] and yet this marine landscape does not of itself receive recognised protection.

Need for NIMA:
to recognise and protect nationally important sea lochs as a feature in their own right.

© UK Strategic Environmental Assessment Area 7

Offshore deep sediment features

The Irish Sea pilot identified a range of deep sedimentary marine features including fine and coarse sediment plains, megaripple fields, deep-water channels, banks and mounds. The fine sediment plains in particular were deemed highly vulnerable and moderately sensitive to mobile fishing gear, yet this marine landscape is neither listed on the EU Habitats Directive nor the OSPAR Directive. Significant mega-ripple features occur within the St Kilda Marine World Heritage Site and yet are totally unprotected.

Need for NIMA:
to give statutory protection to currently unprotected features and contribute to a representative and ecologically coherent network of marine protected areas.

FINDING NIMAs

Professor Geoff Moore

UNIVERSITY MARINE BIOLOGICAL STATION, ISLE OF CUMBRAE

"Nurturing Scotland's national marine wildlife in protected sites is about planting seeds for the future, giving back some of what we have taken, and ensuring that Scotland's seas are a source of pride and a real national asset."

29. The Irish Sea Pilot (2004)

Table 1. *The current protection status of a small selection of marine species, habitats and landscapes of national importance to Scotland*

Feature Type	Feature	Scottish	Distribution of Feature	R/D/Th	Biodiverse	UK BAP	WCA	EU Natura
SPECIES	**SEAWEEDS**							
	Crofter's wig *Ascophyllum nodosum* ecad *mackaii*	✓	Sheltered sea lochs, west Scotland	R		Yes	Yes	Yes *+
	SEA ANEMONES AND RELATIVES							
	Arachnanthus sarsi	✓	Firth of Lorn, Isle of Coll, Isle of Canna, Shetland	R		Yes	No	No
	Fireworks Anemone *Pachycerianthus multiplicatus*	✓	Deep mud in sea lochs, west coast	Th		No	No	No
	Sea Fan Anemone *Amphianthus dohrnii*		West Scotland on *Swiftia pallida*	R/D		Yes		Yes **
	Swiftia pallida	✓	West Scotland on deeper rocks and boulders	D				Yes **
	Tail Sea Pen *Funiculina quadrangularis*	✓	Deep mud in sea lochs, west coast	Th		Yes	No	No
	CRUSTACEAE							
	Spiny Lobster *Palinurus elephas*		Mainly west coast on rock reefs & boulders	D/Th		Yes	No	No
	MOLLUSCS							
	Flame (or file) shell *Limaria hians*	✓	Tidal sea loch and other narrows west coast	Th		No	No	No
	Fanshell *Atrina fragilis*		Sedimentary habitats, mainly west coast	D		Yes	Yes	No
	FISH							
	Common Skate		Argyll and Sound of Mull	D		Yes	No	Yes
	Basking Shark		Firth of Clyde, Sea of Hebrides, Minches and Northern Isles	Th		Yes	Yes	No
	BIRDS							
	Eider Duck		East, west and north coasts, Ythan estuary and Firth of Clyde in particular				Yes	No
	Black Guillemot	✓	Larger sea lochs of west coast, northern and western isles				Yes	No
	MAMMALS							
	Harbour Porpoise		All coasts	D		Yes	Yes	Yes
HABITAT	Flame (or file) shell *(Limaria hians)* reefs	✓	Tidal sea loch and other narrows - west coast	D	✓	Yes		No
	Native oyster *(Ostrea edulis)* beds	✓	West coast of Scotland, best examples Loch Ryan, Loch Sween and Isle of Ulva	D		Yes		No
	Serpula vermicularis reef	✓	Loch Creran, Loch Teacuis	D	✓	Yes		Yes **
	Northern sea fan and sponge communities	✓	Rock reefs & boulders, mainly west coast	D	✓	Yes		Yes **
	Deep burrowed mud with *Funiculina* and *Pachycerianthus*	✓	Deep mud in sea lochs, west coast	D		Yes		No
	Maerl beds	✓	Shallow tide-swept areas such as sea loch narrows and between islands - west coast, western and northern isles	Th	✓	Yes		Yes ***
	Horsemussel reefs	✓	Shallow tideswept areas e.g. sea loch narrows, between islands - west and north coasts	Th	✓	Yes		Yes **
	Tide-swept channels		Sounds and narrows between islands, islands and mainland and in sea lochs		✓			Yes **
	Seagrass Beds	✓	West and north coasts and islands and in some east coast firths	D		Yes		Yes *** +
	Sea cave habitats	✓	Exposed rocky shores and cliffs, including Berwickshire, west and north coasts and isles		✓	No		Yes ++
	Cold water coral *(Lophelia pertusa)* reefs	✓	Continental shelf edge and offshore seamounts Sea of the Hebrides Some North Sea oil platforms	D	✓	Yes		Yes **
	Deep sea sponge communities		Continental shelf edge and offshore seamounts Sea of the Hebrides	Th	✓	Yes		No
MARINE LAND-SCAPES	Sea Lochs	✓	West coast and western isles	Th	✓	No		No
	Offshore deep sediment plains and mega-ripple fields		UK continental shelf to the north and west of Scotland			Yes #		No

KEY

Scottish Most of UK population is found in Scotland
R Rare
D Declining
Th Threat of decline therefore vulnerable and in urgent need of protection (based on combined assessment of Christine Howson, UKBAP reports, The Irish Sea Pilot and Marine Biological Assoc.)

UK BAP Feature is listed on the revised draft UK Biodiversity Action Plan list, April 2007
Subtidal sands and gravels BAP
WCA Feature is protected under Wildlife and Countryside Act (1981)
OSPAR Feature is important on a wider sea (Northeast Atlantic) scale

EU Natura Some protection received under the EU Habitats Directive (relevant Natura feature indicated by asterisks below)
***** Mudflats
****** Reefs
******* Sandbanks
+ Sandflats
++ Submerged or partly submerged sea caves

OSPAR	Potential Threats	Comments
	Coastal construction / Agricultural run-off / Mistaken harvesting	SSSI designation provides protection in Loch Sunart and The Vadills.
Yes	Mobile fishing gear	No targeted protection
No	Mobile fishing gear / Aquaculture	No targeted protection
Yes	Pollution / Mobile fishing gear / Aquaculture / Coastal construction	No targeted protection
Yes	Mobile fishing gear / Aquaculture / Coastal construction	Possible decline in Loch Maddy SAC population
	Pollution / Mobile fishing gear / Aquaculture / Coastal construction	No targeted protection
	Targeted fishing / Bycatch / Divers	Not protected by law. SACS designated for reefs may offer some protection
	Mobile fishing gear / Aquaculture / Coastal construction	No targeted species protection
	Mobile fishing gear / Aquaculture	Protected by law (WCA) but no tool to protect sites
Yes	Over-fishing / Bycatch	Not protected under WCA. No refuge areas established
Yes	Fishing (>12nm) / Bycatch (mobile & static gear) / Disturbance	Unprotected beyond 12nm; no tool to protect critical areas e.g. nursing areas
	Mussel farm conflicts / Pollution (including oil)	Even largest GB eider concentrations would not meet UK marine SPA guidelines
	Poor fisheries management	Areas at sea important for black guillemot cannot currently be protected
	Moorings / Anchors / Mobile fishing gear	
No	Mobile fishing gear / Renewable energy devices / Bridges / Causeways	Some protection in Firth of Lorn SAC but no means to protect in areas lower than EU thresholds. Possible decline in Loch Maddy populations
Yes	Over-exploitation / Mobile fishing gear / Aquaculture / Causeways / Renewable energy devices	Occur too deep to be included in existing Habitats Directive categories
No	Mobile fishing gear / Anchors / Mooring chains	Some protection in a few SACs but no means to protect in areas lower than EU thresholds that may be of national importance
No	Pollution / Mobile fishing gear / Aquaculture / Coastal construction	Some protection in a few SACs but no means to protect in areas that don't fit with EU categories or are lower than EU thresholds that may be of national importance
Yes	Moorings / Pollution / Mobile fishing gear / Aquaculture / Coastal construction	Occur too deep to be included in existing Habitats Directive categories
Yes	Mobile fishing gear / Aquaculture / Causeways / Renewable energy devices	Some protection in a few SACs but no means to protect in areas lower than EU thresholds that may be of national importance Evidence of density reduction in Loch Creran SAC
No		Darwin Mounds (coral on sand mounds) have SAC status. No protection for other deep sediment features
	Mobile fishing gear Aquaculture Causeways Renewable energy devices	Some protection in a few SACs but no means to protect in areas lower than EU thresholds that may be of national importance
Yes	Mobile fishing gear Aquaculture Causeways Renewable energy devices	Some protection in a few SACs but no means to protect in areas lower than EU thresholds that may be of national importance
No	Climate change / Renewable energy devices	
Yes	Mobile deepwater fishing gear / Oil drilling / Pipeline and cable laying	Protected through European & International Fisheries Legislation in Darwin Mounds SAC and on Rockall Bank but no means to protect areas of national importance if any were found lower than EU thresholds
Yes	Mobile deepwater fishing gear / Oil drilling / Pipeline and cable laying	Potential for protection through Offshore SACs for reefs
No	All human activities	Not listed on EU Habitats Directive
N0	Offshore development / Aggregate extraction / Maintenance and suction dredging / Mobile fishing gear	Darwin Mounds (coral on sand mounds) have SAC status. No protection for other deep sediment features

What would an 'ecologically coherent' network of NIMAs include?

IT IS broadly acknowledged that a representative and ecologically coherent network of protected areas that meets international commitments should include the following:[30]

- **representative examples of all the broad marine habitat types**
- **areas of exceptional species or habitat biodiversity**
- **areas to protect Nationally Important Marine Features**[31]
- **important areas for aggregations and critical life history stages of mobile species (e.g. feeding, spawning, mating and migration sites)**

Representative NIMAs

The aim of representative NIMAs would be to identify and protect good examples of Scotland's representative features, allowing them to develop as naturally as possible and in as close to pristine condition as possible.[32]

© Paul Kay

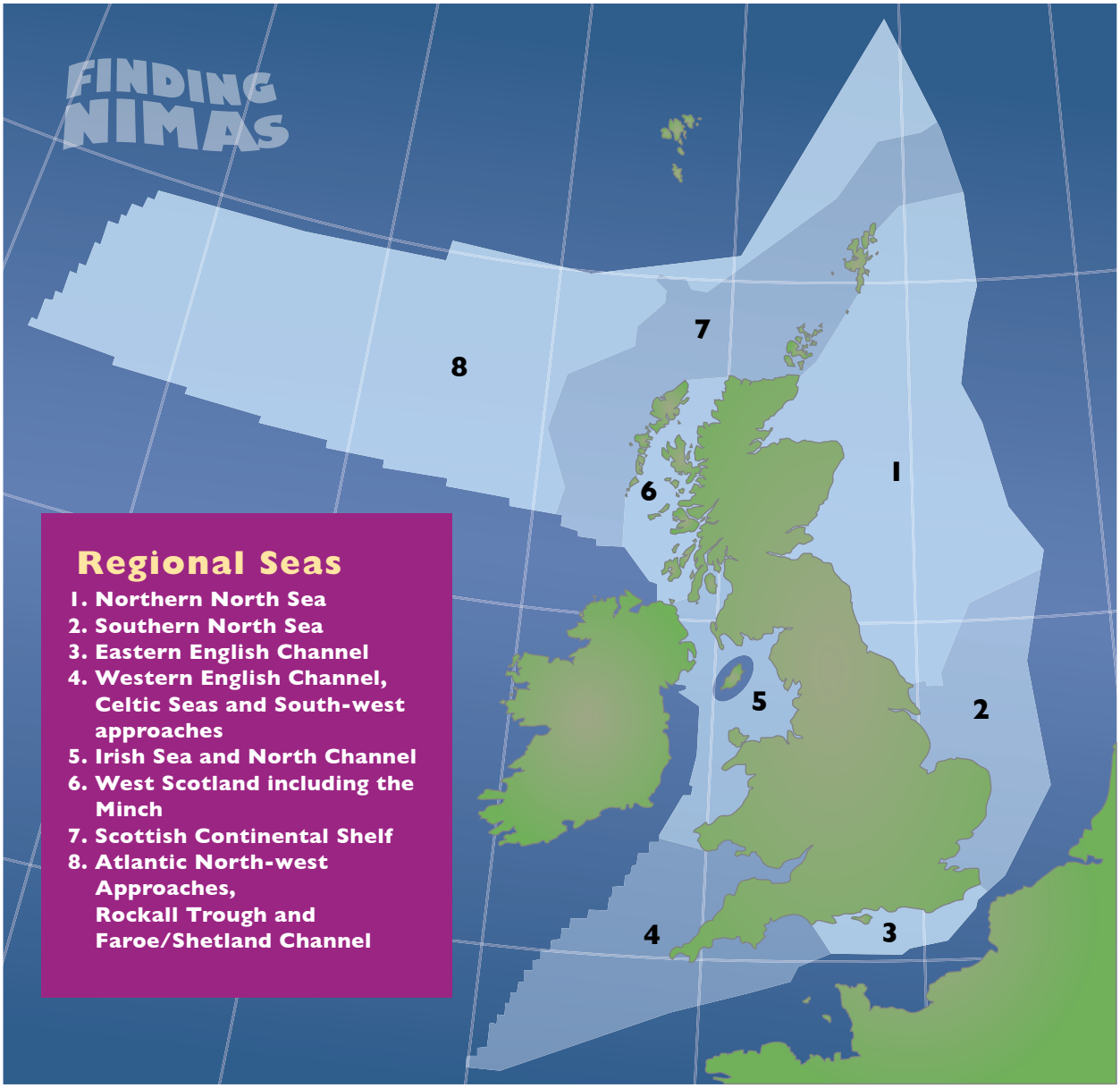
Jewell anemone covered reef

Dr J Murray Roberts
SCOTTISH ASSOCIATION FOR MARINE SCIENCE

"Scotland has an internationally important marine environment from shallow tidal rapids to deep-water coral reefs and should take the lead in applying sound science to develop ecologically meaningful marine reserve networks to protect this national heritage for generations to come."

30. OSPAR, Review of Marine Nature Conservation, MarLIN and UK Marine Bill White Paper broadly concur on these criteria.
31. The UK Government is drawing up a Nationally Important Marine Features list, which will include marine species, habitats, landscapes and cultural features of which the UK has a high proportion of the global total, or which are rare, threatened or declining. A similar process should take place for Scotland.
32. *"for representative areas it will be important to enable the habitats and species populations within these areas to develop as naturally as possible… activities which would lead to significant disturbance of these areas, or exploitation of their biological resources, are likely to require stricter control"* UK Marine Bill Consultation (2006)

Figure 1. *Suggested UK Regional Seas according to the Joint Nature Conservation Committee*



The broad marine habitat and landscape types that are representative of UK inshore and offshore waters have been identified.[33] Further detailed work is beginning to be carried out to identify how best to sample these representative features for protection within each 'regional sea'.[34]

Identifying representative features within each of the 'regional seas' adjoining Scotland - the Northern North Sea, Minches and West Scotland, Irish Sea and Scottish continental shelf seas - would give a good geographical spread of sites (see Figure 1).

Representative features could usefully be considered at the range of scales outlined in the Review of Marine Nature Conservation, nesting one within another. An example of this nesting is given in Table 2 on the next page.

33. The Irish Sea Pilot (2004), Review of Marine Nature Conservation (2004), Safeguarding Sea Life (2005)

34. Connor, D.W., Gilliland, P.M., Golding, N, Robinson, P, Todd, D., & Verling, E. (2006). *UKSeaMap: the mapping of seabed and water column features of UK seas.* Joint Nature Conservation Committee, Peterborough.

Table 2. *Illustration of features nesting one within another at different scales*

Scale of feature	Nest of Features			Potential Mechanisms
Wider Sea	North east Atlantic			EU Marine Directive, OSPAR Regional Seas, ICES
Regional Sea	West Scotland including the Minch			Regional Seas Marine Spatial Plan
Marine Landscape	Fjordic sea loch			Nationally Important Marine Areas for landscape-scale features identified within regional Marine Spatial Planning system Coastal and Marine National Park
Habitat*	Deep burrowed mud	Sheltered bedrock reefs	Sugar kelp habitats in variable salinity	Nationally Important Marine Area for habitats within local Marine Spatial Plan
Species**	Tall sea pen Fireworks anemone Scottish langoustine	Brachiopods Peacock worms Sea loch anemones	Sugar kelp Shore urchins Horsemussels	Nationally Important Marine Area for host habitats within a local Marine Plan. For dense aggregations of some individual species, e.g. tall sea pens, NIMA designation may be merited

* See JNNC biotope manual for in-depth list of habitats ** See developing UK and Scottish marine species lists

Canna with Rum in background

Gordon and Morag Brown

SKYAK ADVENTURES, ISLE OF SKYE

"Kayakers from all over the world enjoy Scotland's spectacular coastal scenery and wildlife. We'd like to see more of it protected so that businesses dependent on the marine environment can have a secure future."

Soft corals flourish on tide-swept reefs

Biologically diverse NIMAs

Initial identification of marine biodiversity 'hotspots' in UK waters has been undertaken.[35] These areas support higher than average concentrations of important marine species, habitats and/or landscapes, and a NIMA would therefore protect many features at once. Biodiverse areas with many interconnected species are known to be more resilient to damage than lower diversity systems, so these NIMAs would potentially have greater value in buffering the marine ecosystem against the effects of climate change.

NIMAs for Nationally Important Marine Features

Rare, threatened or declining species and habitats, those for which the UK has a high proportion of the global total, or otherwise exceptional features that need urgent protection (all Nationally Important Marine Features or NIMFs) should also be part of the NIMA network. Lists of these NIMFs are being drawn up for both the UK and Scotland.

NIMAs for mobile species

Mobile species such as fish, cetaceans and birds can benefit from protection of areas that are critical to them at different stages of their lives. These include 'migration bottlenecks', where many animals pass on migration, and breeding, nursery, feeding or resting grounds. There is growing evidence that the protection of these critical areas could be particularly helpful for commercial fish species, and it is a matter for discussion whether these should be delivered through fisheries management or marine conservation measures.

35. WWF and Marine Biological Association (2007) *Marine Biodiversity Hotspots.*

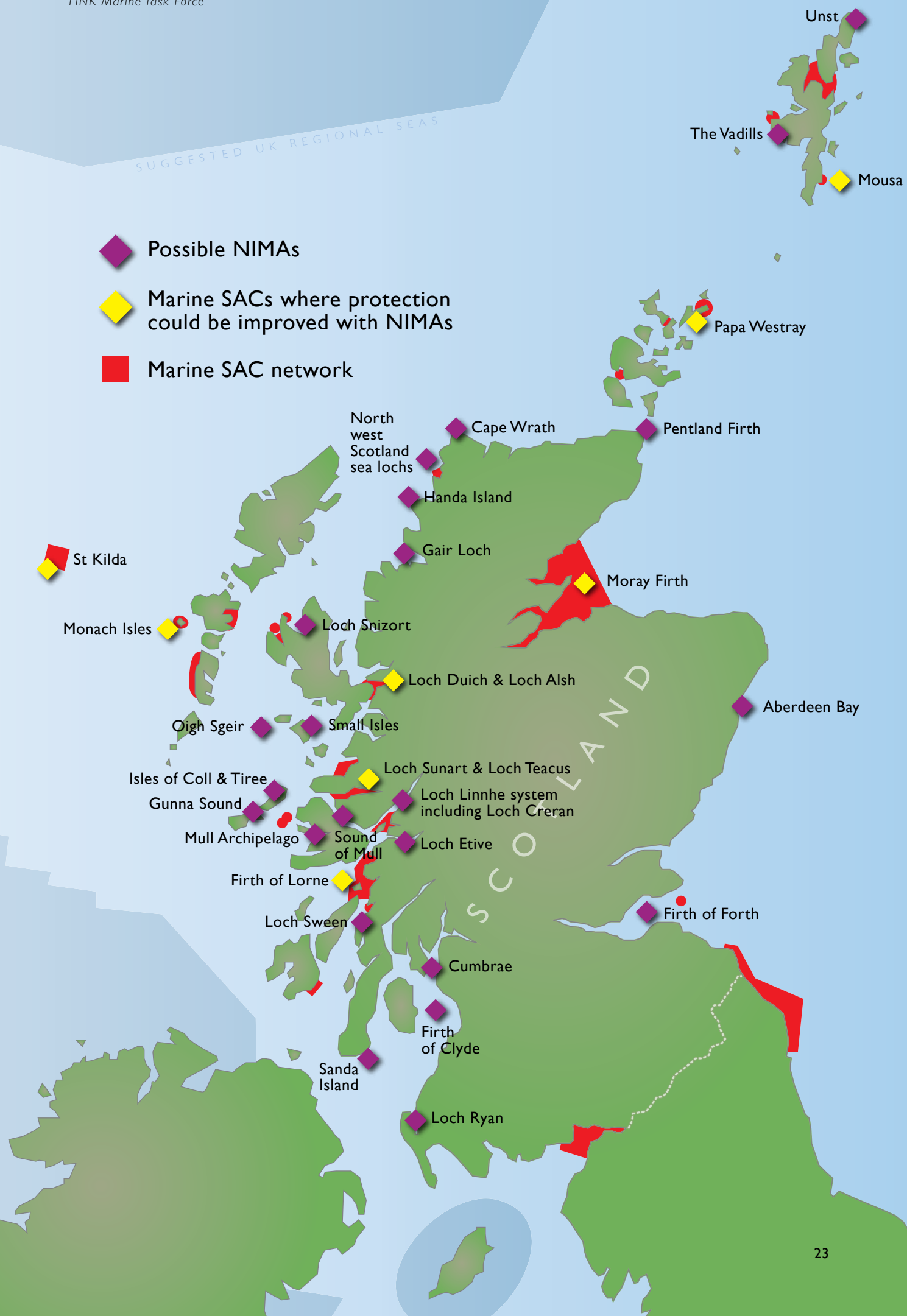
What sort of places might be chosen as Nationally Important Marine Areas?

THERE has already been a great deal of work to identify important areas for marine nature conservation in the UK. It is not clear how many of these might be suitable NIMAs, but they are a useful indication of the sorts of features that might need special care, both for their own sake and to underpin the health and productivity of marine ecosystems. One study in 1988 identified 118 sites of UK marine nature conservation interest in Scotland, with 57 in the Minches and around the west of Scotland alone.[36] Scottish Natural Heritage has identified 29 'Marine Consultation Areas', of which 8 are now marine SACs. The UK Department for Environment, Food and Rural Affairs (Defra), has also commissioned research on a UK MPA network.[37]

The map illustrates the existing suite of European Marine SACs, and a selection of areas that might qualify as NIMAs.

The basking shark is the world's second largest fish

36. Gubbay, S. (1988) Coastal Directory for Marine Nature Conservation, Marine Conservation Society
37. Richardson, E.A., Kaiser, M.J., Hiddink, J.G., Galanidi, M. and Donald, E.J. (2006) Developing Scenarios for a Network of Marine Protected Areas. University of Wales, Bangor for Defra


SUGGESTED UK REGIONAL SEAS
Possible NIMAs
Marine SACs where protection could be improved with NIMAs
Marine SAC network
Unst
The Vadills
Mousa
Papa Westray
Cape Wrath
Pentland Firth
North west Scotland sea lochs
Handa Island
Gair Loch
St Kilda
Moray Firth
Monach Isles
Loch Snizort
Loch Duich & Loch Alsh
Aberdeen Bay
Oigh Sgeir
Small Isles
Loch Sunart & Loch Teacus
Isles of Coll & Tiree
Gunna Sound
Loch Linnhe system including Loch Creran
Mull Archipelago
Sound of Mull
Loch Etive
Firth of Lorne
SCOTLAND
Firth of Forth
Loch Sween
Cumbrae
Firth of Clyde
Sanda Island
Loch Ryan

NIMA Case Studies

NIMAs would be chosen on ecological principles.
These case studies and the subsequent table illustrate some Scottish marine areas that might be expected to qualify as NIMAs on the basis of representativity; high biodiversity; good areas for nationally important marine species, habitats or landscapes (NIMFs) or as critical areas for mobile species, such as migration bottlenecks and spawning, nursery, calving, feeding or resting areas.


© Calum Duncan/MCS

Loch Etive

This is unique among Scottish sealochs for its unusually high inflow of freshwater and variations in salinity, caused by the rock sill at the Falls of Lora. Although species diversity in the loch is not particularly high, many of the habitat types and the zonation of habitats and species are unique to Loch Etive. Several species are found in much greater abundance than in other sealochs.

A NIMA would protect a unique nationally important sea loch that, being so enclosed, is particularly susceptible to excess nutrients and over-exploitation.


© Howard Wood

Firth of Clyde

The Clyde is the most important site in Britain for eider duck, and contains a range of important features, from maerl beds to sea lochs. Loch Shira, an arm of upper Loch Fyne (itself a Marine Consultation Area) contains the densest known colonies of spectacular fireworks anemones (*Pachycerianthus multiplicatus*) in Scotland. There are flameshell (*Limaria hians*) reefs in the narrows at Port Ann, sheltered reef and deep mud communities throughout the Clyde sea lochs, maerl beds off Inchmarnock and in Lamlash Bay, Isle of Arran, an extensive seagrass bed in Whiting Bay, tideswept reefs off the Mull of Kintyre and Pladda and extensive areas of deep burrowed mud in the Clyde Sea basin itself. None of the nationally important features in the Firth of Clyde meets European Habitats Directive thresholds for site designation. There are no European marine Special Areas of Conservation in the Firth of Clyde, and only two European Special Protection Areas (SPAs) for the landward estuary (redshank only) and for Ailsa Craig (breeding seabirds).

A range of NIMAs in the Firth of Clyde would help protect feeding and rafting areas for eider, important habitats such as maerl beds, seagrass beds, flameshell reefs and deep burrowed muds and marine landscapes such as sea lochs that are currently unprotected.

Giving local communities a voice

The Community of Arran Seabed Trust (COAST), a local campaign group with 1,800 members, has been lobbying for the creation of a No Take Zone to protect the remnant area of maerl bed in Lamlash bay from all fishing activity, and for the rest of the bay to be protected from damage by mobile gear fishing, to allow the regeneration of maerl, fish and shellfish. No fit-for-purpose legal tool exists to address their proposals. Instead COAST had to negotiate over several years through Clyde fisheries management procedures.

38. Department for Environment, Food and Rural Affairs (2007) A Sea Change, A Marine Bill White Paper p.71 *A site protection mechanism could control the most severe impacts on the fan shell, but we cannot currently do this'.*


© Calum Duncan/MCS

Loch Sween

On the west coast of Argyll, Loch Sween is a National Scenic Area that is also beautiful and biologically diverse beneath the surface. Within this complex sea loch system, extensive maerl beds carpet tidal channels, mud shrimps farm bacteria in tunnels, tide-swept narrows harbour many species and bright green half-metre-long worms are all found. Loch Sween is a recognised high quality marine site, reflected in its status as a non-statutory Marine Consultation Area, yet the features that make it special are not European criteria, there is no legal means to designate the site as nationally important, and it remains threatened from human activities such as fish farm development. *Serpula vermicularis* reefs recorded in Linne Mhuirich, an extremely sheltered lagoon within Loch Sween,[39] have since apparently died, although the reasons for this are unclear.[40]

A NIMA would ensure proper recognition and protection for a high quality, diverse sea loch of recognised national importance.


© George Brown

Lochs Duich, Long and Alsh

Only the reefs at this important site are protected under EU legislation. Loch Duich contains among the largest beds of crofter's wig seaweed (*Ascophyllum nododosum* ecad *mackaii*) in the world and yet this non-reef area is excluded from the marine Special Area of Conservation (SAC). Similarly, its unprotected deep muds support the spectacular but uncommon tall sea pen (*Funiculina quadrangularis*), vulnerable to langoustine trawling, and unprotected gravel habitats support the endangered fan mussel (*Atrina fragilis*), vulnerable to scallop dredging. This is one of only very few sites in the UK where the fan mussel has been found inshore. Although the fan mussel is listed on the Wildlife and Countryside Act, and both the fan mussel and tall sea pen are on the UK BAP list, they can only be adequately protected within a protected area.[38]

A NIMA would protect valuable species and habitats not protected by the European Marine SAC designation.


© Richard Luxmoore/NTS

St Kilda

St Kilda is the UK's only Marine World Heritage Site, one of only 30 worldwide, and its outstanding reefs and caves are protected within an SAC. However, other habitats and features within the site, such as the mega-ripples and sediment communities are not protected. The SAC has no agreed management plan and therefore no protection measures in force. For example, scallop dredging can take place perfectly legally in the waters of the World Heritage Site. The SPA for breeding seabirds does not currently extend below the mean low water springs (MLWS) so foraging areas for seabirds are not included within the site boundary.

A NIMA would protect valuable marine species, habitats and landscapes not protected by the SAC designation and important areas for birds.

39. Moore, C. G., Saunders, G. R. and Harries, D. B. (1998). The status and ecology of reefs of *Serpula vermicularis* L-(Polychaeta : Serpulidae) in Scotland. *Aquatic Conservation-Marine and Freshwater Ecosystems* 8, 645-656.

40 UK Habitat Action Plan for serpulid reefs. www.ukbap.org.uk


© Paul Kay

Small Isles (Rum, Eigg, Muck and Canna)

The waters around Canna support important communities of rare invertebrates, such as the burrowing sea anemone *Arachnanthus sarsi* and the red sea cucumber *Parastichopus tremulus*, as well as good examples of reefs and northern seafan communities. There are indications of colonies of the coldwater coral *Lophelia pertusa* and the rare fan mussel *Atrina fragilis*. Rum hosts the world's largest breeding colony of Manx shearwater. While their breeding area on land is protected within a European Special Area of Protection (SPA), this protection ends at the low tide mark and does not extend to feeding or rafting areas around the islands.

The NIMA would protect important invertebrate species and habitats and could extend protection to critical areas for Manx shearwater, cetaceans and basking sharks in the waters around the islands.


© Nathalie Pion

Isle of Unst

Due to the Isle of Unst being the most northerly in the British Isles, it has significant populations of cold water species, such as the sea urchin *Strongylocentrotus droebachiensis*. Although 'outliers' of large populations in Scandinavia, such species are important in a UK context. Unst also has a wide variety of habitats that make the area comparatively species rich, including highly wave-exposed sites, others such as Bluemull Sound with strong tidal streams and rare brittlestar communities, and very sheltered conditions in voes and sounds between the islands. The island is also important for seabirds, including the National Nature Reserve at Hermaness, and the area attracts large mammals including killer whale (*Orcinus orca*).[41]

A NIMA would protect a good example of a site that is representative of UK coldwater species and habitats.


© Colin Speedie

Critical area NIMAs for Basking Sharks

As a result of effort-based survey work, two Scottish basking shark 'hotspots' were recently identified: Gunna Sound, between the islands of Coll and Tiree, and around the rocky island of Oigh Sgeir, five miles southwest of the Isle of Canna.[42] High proportions of large sharks, some over 9 metres in length, and what were perhaps baby sharks were observed for the first time in the same area. Sharks could therefore be gathering in these areas for courtship and breeding. It is promising that populations are reproducing and recovering after years of persecution, but basking sharks remain globally vulnerable and are remain under pressure from wildlife tourism and by-catch in Scottish waters.

NIMAs at Gunna Sound and Oigh Sgeir would safeguard these important areas for basking shark courtship and breeding and help maintain population recovery.

41. Scottish Wildlife Trust (2006) Better protection needed for Scotland's growing basking shark population. Press Release 13/09/06

Critical area NIMAs for Whales and Dolphins

The waters around the Small Isles, extending from the north-eastern tip of the Isle of Coll to the Sound of Sleat, is one of the most heavily-used feeding areas in Scotland for harbour porpoise (*Phocoena phocoena*) and minke whales (*Balaenoptera acutorostrata*). The dense schools of fish in this region also attract a number of other species; killer whales (*Orcinus orca*) and common (*Delphinus delphus*), Risso's (*Grampus griseus*), bottlenose (*Tursiops truncatus*) and white-beaked (*Lagenorhynchus albirostris*) dolphins are seen. Rare sightings of humpback (*Megaptera novaeangliae*), fin (*Balaenoptera physalus*) and northern bottlenose (*Hyperoodon ampullatus*) whales have also been reported. The northern entrance to the Sound of Mull has some of the highest densities of harbour porpoise in UK waters, providing important habitat for this species, while the entire Sound is likely to provide a vital corridor for movement of species such as bottlenose dolphins and harbour porpoise along the coast.

A NIMA in the Sound of Mull would recognise its importance as a cetacean migration corridor and around the Small Isles would help safeguard important cetacean feeding areas.

An occasional visitor – the humpback whale

Nick Riddiford

CO-ORDINATOR, FIMETI AND CHAIRMAN, FAIR ISLE COMMITTEE AND COMMUNITY ASSOCIATION

"The sea has always been at the heart of our economic and social life, but the Fair Isle community is still excluded from having any say in its control and management. We would like to see the Scottish Government bring forward a Marine Bill that gives a local voice in marine planning and ensures that a healthy natural environment becomes the basis for our future economic and social well-being."

42. WWF and Marine Biological Association (2007) Marine Biodiversity Hotspots

Table 3. *A selection of some Scottish sites that might be expected to qualify as Nationally Important Marine Areas on the basis of representativity; high biodiversity; good areas for nationally important marine species (including birds), habitats or landscapes (together Nationally Important Marine Features) or as critical areas for mobile species, principally basking sharks or cetaceans. Some existing SACs have been included where important features within them would benefit from added protection.*

Regional Sea	SITE	NIMA Criteria							Existing Designations		
				Nationally Important Marine Feature							
		Representative	Biodiverse	Birds	Other Species	Habitat	Land-scape	Mobile Species	Marine SAC	Seabird SPA	Seabird SSSI
IRISH SEA	Loch Ryan					✓					
	Sanda Island			✓	✓	✓					✓
	Firth of Clyde	✓		✓	✓	✓	✓			✓	✓
	Isle of Cumbrae				✓	✓					
WEST SCOTLAND INCLUDING THE MINCH	Loch Sween	✓	✓		✓	✓	✓				
	Firth of Lorn		✓		✓	✓			✓		
	Loch Linnhe system, including Loch Creran		✓			✓	✓		✓		
	Loch Etive					✓	✓				
	Mull archipelago	✓	✓		✓	✓			✓	✓	
	Sound of Mull					✓		✓			
	Loch Sunart and Loch Teacuis		✓			✓	✓		✓		
	Isles of Coll and Tiree		✓	✓		✓					
	Gunna Sound							✓			
	Small Isles		✓		✓	✓		✓			
	Oigh Sgeir							✓			
	Lochs Duich, Long and Alsh		✓		✓	✓	✓		✓		
	Loch Snizort		✓			✓	✓				
	Handa Island			✓		✓				✓	
	Northwest Scotland sea lochs (Loch Laxford to Gair Loch)		✓	✓		✓	✓		✓	✓	
SCOTTISH CONTINENTAL SHELF	Cape Wrath	✓	✓	✓		✓					✓
	Papa Westray, Orkney			✓							✓
	Pentland Firth	✓				✓					
	St Kilda	✓	✓	✓		✓	✓		✓	✓	
	The Vadills, Shetland	✓	✓		✓	✓			✓		
	Monach Isles			✓					✓		✓
NORTHERN NORTH SEA	Isle of Unst	✓		✓		✓				✓	
	Mousa			✓	✓	✓			✓	✓	✓
	Moray Firth					✓		✓	✓	✓	
	Aberdeen Bay			✓				✓			
	Firth of Forth	✓		✓			✓			✓	

FINDING NIMAs

Comment and Rationale
Among the best native oyster (*Ostrea edulis*) beds in Scotland
Protection needed for Black Guillemot foraging adjacent to terrestrial SSSI and for tide-swept biodiverse reefs supporting pink sea fingers (*Alcyonium hibernicum*) and spiny lobster (*Palinurus elephas*).
There are no marine SACs in the Clyde. Many possible NIMAs would therefore benefit from protection, including sites for nationally important habitats (maerl, flameshell reefs, sea grass beds and deep burrowed mud are all found), landscapes (the Clyde estuary and deep sheltered sealochs such as Loch Fyne and Loch Goil) and representative habitats. The Firth of Clyde is also important for seabird colonies, such as at Ailsa Craig, wintering marine birds and the most important area in Britain for eider duck, whose foraging areas would benefit from protection
Of potential European Importance for seaweeds. One of a draft list of over 25 Important Plant Areas for seaweeds in Scotland being refined by botanists.
Unique sheltered low-salinity habitats, oyster beds, maerl beds, tide-swept channels and deep muds, all currently unprotected.
Best northern sea fan communities in UK, with comparatively dense sea fan anemone distribution. Extremely biodiverse area with variety of tidal rapids, including the Coryvreckan, an outstanding tide-swept feature. The rare *Arachnanthus sarsi* burrowing anemone is also recorded here in unprotected habitat. Recent scallop dredging ban on two-year precautionary basis welcome, particularly following recent evidence of damage to species-rich stabilised cobble reefs.
Highly biodiverse sea loch system, rated as a possible UK 'hotspot'. Only Loch Creran is protected as SAC, containing best examples of Serpulid worm reefs in Europe and also horsemussel reefs. Recent ban on scallop dredging in Loch Creran to comply with EU Habitats Directive welcome although evidence exists of mooring chain and damage from edible mussel middens. Deep burrowed mud habitat in Loch Creran not officially protected.
Unique variable salinity fjordic sea loch with ice-age relic species and fiercest tidal rapids of any sea loch narrows. Not currently protected.
The archipelago of Mull, Ulva, Iona and Staffa are a 'biodiversity hotspot' for tide-swept sounds and channels, reefs, maerl, seagrass and oyster beds and deep sheltered sea lochs. Sea lochs area also important for wintering marine birds such as great northern diver. No protection in this important area other than Treshnish Isles for grey seals SAC and seabirds SPA.
Important migration corridor/bottleneck for bottlenose dolphin, porpoise and other cetaceans. Important harbour porpoise feeding area at each end of Sound. Also an important area for common skate (*Raja batis*). Maerl beds in Salen Bay and flameshell reefs at south end of Sound.
Possible UK biodiversity 'hotspot'. Reefs only a secondary reason for SAC designation. Hosts largest flameshell (*Limaria hians*) reefs in UK although not directly protected since not recognised as reefs. Bedrock in entrance to Loch Sunart and Sound of Mull subject to weak tides and supports species rich habitats with a number found in few other Scottish locations. Deep burrowed mud in loch basin not currently protected. Recently discovered Serpulid worm reefs in Loch Teacuis and Loch Sunart flameshell reefs and burrowed mud would be protected with NIMA designation.
Islands with biodiverse reefs and tide-swept channels. Also support wintering great northern diver.
Basking shark 'hotspot' with high numbers of large and juvenile sharks. Important area for courtship and breeding.
Waters surrounding Isles of Canna, Rum, Eigg and Muck, extending to Coll and the Sound of Sleat important as minke whale and harbour porpoise feeding area. Also present are northern sea fan communities, rare invertebrates such as *Arachnanthus sarsi* and possibly *Atrina fragilis* and *Lophelia pertusa.*
Basking shark 'hotspot' with high numbers of large and juvenile sharks. Important area for courtship and breeding.
Possible UK biodiversity 'hotspot' protected as SAC for tide-swept and sheltered reefs. However the deep burrowed mud basins, *Atrina fragilis* and crofter's wig sites remain unprotected.
Possible UK biodiversity 'hotspot' on Isle of Skye supporting rich sea loch habitats.[43]
Tide-swept bedrock reefs, some maerl beds and important seabird colonies. No protection exists at sea for seabird feeding areas.
Loch Laxford to Loch Ewe is considered a potential UK biodiversity 'hotspot' for marine species and habitats, but only Loch Laxford designated an SAC. The sea lochs from Loch Broom to Gair Loch (SPA) are important for wintering marine waterfowl, particularly black-throated and great northern divers, but no protection exists at sea.
Exposed rocky headland with unique, therefore representative, tide-swept and wave-exposed filter-feeding reef habitats. Also inlets with extensive sheltered sediment flats.
Protection needed for Black Guillemot foraging areas adjacent to terrestrial SSSI
Major UK sound with some of the fastest tides in the world.
Outstanding remote archipelago with clear, oceanic water designated for exposed offshore reefs and sea caves. Mega ripples and sediment habitats unprotected within existing SAC. Seabird SPA extends only to MLWS with no protection for offshore feeding areas.
Unique, therefore the only representative, lagoon complex with unusual sea cucumber beds, maerl, seagrass beds and crofter's wig sites. Extremely fragile semi-enclosed lagoons.
Protection needed for Black Guillemot feeding and rafting adjacent to terrestrial SSSI. Existing SAC for grey seals.
Remote, exposed and tide-swept habitats at tip of British Isles, representative of coldwater marine habitats. Hermaness SPA and SSSI protects seabird breeding colony but no protection at sea.
Protection needed for Black Guillemot feeding adjacent to terrestrial SSSI. Designated SAC for reefs and common seals.
Important breeding, nursery and feeding area for bottlenose dolphin, for which inner Firth SAC designated along with sandbanks. Concerns over proposed marina developments and levels of protection available for dolphins. Interesting geological features - 'mermaids tables' - also found in waters east of Rockfield. Nationally important area for wintering marine waterfowl.
Important foraging area for breeding seabirds from nearby coastal SPAs, for wintering marine waterfowl, hotspot for migratory seabirds. Area becoming one of best places in UK to see dolphins from shore.
Industrialised Firth important for wintering marine waterfowl and foraging areas for breeding seabirds from Forth Islands and Imperial Dock Lock SPAs. No area-based protection available for bird foraging areas at sea.

43. WWF and Marine Biological Association (2007) *Marine Biodiversity Hotspots.*

How could NIMAs work?

NATIONALLY Important Marine Areas (NIMAS) are one tool that would help to regenerate our seas, protecting wildlife for its own sake, but also bolstering the sea's productivity and resilience. They will work best if they are part of a complete 'toolbox' of improved marine planning and management which is based on the principle that marine nature conservation underpins economic productivity, and that healthy seas are a prerequisite for more productive seas.

In March 2007 the Ministerial Advisory Group on the Marine and Coastal Strategy (AGMACS), advocated a 'three pillar' approach to marine nature conservation, covering public policy and species protection as well as site protection. LINK broadly supports the AGMACS recommendations, and believes they could provide the context for improvements in marine nature conservation and the general health of our seas.

The changes in general marine policy recommended by AGMACS included a new system of Marine Spatial Planning with national and local-level plans, the creation of a Scottish Marine Management Organisation (SMMO) to oversee marine planning and the establishment of Marine Ecosystem Objectives, key recovery targets to measure progress towards healthier marine environment. The AGMACS Marine Nature Conservation 'workstream' reported on the need for NIMAs, the addition of key marine species to the Wildlife and Countryside Act (WCA), the extension of WCA powers to 200nm, and better-resourced and targeted enforcement of wildlife laws.

Against this background LINK believes that a new system of site protection must have the following important elements if it is to contribute to the health of the marine environment and fulfil international obligations:

Gannets over St Kilda

Selection

Sites must be selected according to agreed ecological criteria alone and managed according to ecological need. Criteria on the scale and proportion of features to be protected should be drawn up by ecological experts and agreed at the highest level prior to site selection.

Dr Kenny Taylor
WRITER AND BROADCASTER

"Scotland's seas and their amazing range of wildlife are a global asset with huge national value. Green tourism, fisheries and science all benefit, as do the many people who simply get pleasure from exploring this marine heritage. It's a legacy that deserves much better protection and will grow and grow if it is cherished."

Ecological criteria are essential for site selection

Socio-economic factors

These should come into play after the initial scientific site selection process, for example in management decisions where the ecological needs of the site can be met, and in choosing between similar alternative sites, where there are two or more sites that could fulfil the same ecological need. Some sites will be of unique or specific ecological importance so not open to alternatives.

- **Management**

The site protection mechanism must provide for the restriction of some or all activities and the adaptation of management as appropriate for the ecological needs of the site. It should provide for monitoring of change, measurement of progress towards environmental objectives and effective enforcement. It should improve on the shortcomings of the EU network of sites.

- **Expertise**

Expert marine ecological advice should play a key role in all stages of criteria setting, site selection and management.

- **International Obligations** Sites should be in place to meet Scotland's international obligations .

- **Management Context**

The new site protection network should operate within a new marine planning and management system founded on the principle that a healthy, biodiverse marine environment must be the keystone for sustainable social and economic activity.

- **Local Involvement**

There should be local involvement, where possible and appropriate, in the management of sites.

Options for delivering NIMA site protection

Option 1

Identification and management separate from Marine Spatial Planning

The new NIMA network is established immediately, and integrated into MSP at a later stage.

PROS ✔

- **Marine Spatial Planning may take a long time and many of these marine species and habitats require urgent protection. Sites are needed to meet 2010 international commitments.**
- **Ecological criteria met, leading to improvements for marine ecosystem health.**
- **Simple designation of sites is a well-established process, with clear ecological objectives and responsibilities enshrined in law.**

CONS ✘

- **A traditional designation process may be unpopular with some stakeholders**

Option 2

Identification and management fully within the Marine Spatial Planning system

A list of sites taken to the marine spatial planning process for negotiation with other interests. Sites managed entirely through the spatial plan, overseen by the Scottish Marine Management Organisation (SMMO).

PROS ✔

- **Involvement of stakeholders in decisions over location and management of all sites.**
- **Could fulfil ecological criteria if the purpose of MSP is explicitly for the protection, restoration, enhancement and sustainable use of the sea and its resources, based on the precautionary principle with powers necessary to give greater weight to 'conserve and enhance the natural and cultural heritage of the area' where conflict arises (Sandford Principle).[44] This is a 'strong sustainability' basis for MSP, which views the health of the natural resource and 'living within environmental limits' as having primacy, rather than nature conservation as an equivalent 'use' to be traded-off against other commercial or social uses of the sea.**

CONS ✘

- **Will fail to meet ecological criteria if MSP does not have the above foundation, as site selection and management will be the result of negotiation between all stakeholders, not all of whom will share the view that the long-term health of the natural resource should have primacy.**

Option 3

Identification and management partially within the Marine Spatial Planning system

Ecological criteria on the scale and proportion of features to be protected are drawn up by ecological experts and agreed by SMMO/Government. Some negotiation on the location of alternative sites, where these are available, is possible in the preparation of Marine Spatial Plans. Sites are identified in the MSP, management and enforcement largely undertaken through the plan. Expert marine ecological advice plays a key role in all stages of criteria setting, site selection, management and review.

PROS ✔

- **Stakeholders involved in site selection, where alternatives are available, and in management.**
- **Ecological criteria met, leading to improvements for marine ecosystem health.**

CONS ✘

- **Will fail to meet ecological criteria if MSP does not have the above foundation, as site selection and management will be the result of negotiation between all stakeholders, not all of whom will share the view that the long-term health of the natural resource should have primacy.**
- **Marine Spatial Planning may take a long time and many of these marine habitats and species require urgent protection. Sites are needed to meet 2010 international commitments.**

Flameshell reef

THERE are various options for the delivery of site protection in relation to Marine Spatial Planning (MSP), which LINK believes have advantages and disadvantages in terms of the above important elements:

✔ LINK favour Option 3 if environment-centred Marine Spatial Planning is established quickly, and Option 1 if there are likely to be delays.

✘ LINK has concerns that Option 2 will not result in a healthier marine environment, but rather the continuation of the status quo.

44. Lord Sandford chaired the National Parks Policy Review Committee between 1971 and 1974. The Sandford Principle is set down in the Environment Act 1995 (England and Wales) and National Parks (Scotland) Act 2000.

FINDING NIMAs

Jack Morrison

CHAIRMAN SCOTTISH SUB AQUA CLUB, ED. SCOTTISH DIVER MAGAZINE

"As divers we have seen first hand the gradual degradation of our marine habitats. Scotland could lead the world by implementing a Marine Bill that encourages sustainable fishing methods, promotes eco-tourism and protects areas for the benefit of remote communities. Are we brave enough to protect Scotland's seas for future generations?"

The Way Forward

FINDING NIMAS

EXISTING laws are not sufficient to protect marine features of national importance to Scotland. There is no marine management framework to secure the health of Scotland's seas for the future.

Within an improved framework for marine management a comprehensive network of Nationally Important Marine Areas is needed for wildlife protection, to help Scotland meet its international commitments, and to ensure that Scotland's seas thrive and continue to support economic activity.

This network would consist of good examples of sites chosen for representativity; high biodiversity; nationally important marine species, habitats and landscapes and as critical areas for mobile species. Each NIMA would be chosen according to scientific criteria and managed according to its ecological needs.

In light of this Scottish Environment LINK Marine Task Force urges the Scottish Government to take the following action:

● Scottish Marine Bill

Move forward with a Scottish Marine Bill that is developed for the protection, restoration, enhancement and sustainable use of the sea and its resources. This should deliver the goals of a UK marine policy statement delivered by a UK Marine Bill.

● NIMAs

Establish a network of Nationally Important Marine Areas (NIMAs), selected according to ecological criteria and managed according to the ecological needs of the features being protected. This must include effective monitoring, enforcement and review of progress against the health of the marine environment.

● Marine Spacial Planning system (MSP)

Establish through the Scottish Marine Bill, a statutory system of Marine Spatial Planning in Scotland's territorial waters to further the protection, restoration, enhancement and sustainable use of the sea and its resources.

● List Nationally Important Marine Features

Develop a Scottish list of Nationally Important Marine Features to help inform the selection of NIMAs.

Opposite: *Sea loch reef life*

Inside back cover: *Red Blenny in crevice* © Paul Kay

© Paul Kay

Scottish Environment LINK

Scottish Environment LINK is the forum for Scotland's voluntary environment organisations representing a broad spectrum of environmental interests with the common goal of contributing to a more environmentally sustainable society. This report has been produced with funding from the Esmée Fairbairn Foundation, The Tubney Charitable Trust, Lisbet Rausing and Peter Baldwin on behalf of the Marine Task Force, comprising the following member bodies:

Hebridean Whale and Dolphin Trust

Marine Conservation Society

The National Trust for Scotland

RSPB

Scottish Wildlife Trust

WDCS

WWF

LINK is a Scottish charity (Reg SC000296) and a company limited by guarantee.

Published by Scottish Environment LINK, December 2007
2 Grosvenor House, Shore Road, Perth, PH2 8BD

www.scotlink.org