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Appendix 6.a Views on EBA and co-management from project partners

Welsh Fishermen's Association (WFA)

The fishing industry partakes in the local, regional and national management of fisheries and other marine activities, uses and interests to ensure a healthy and productive sea for the benefit of not only commercial species but all wildlife and their habitats. The industry is included in a national and local fisheries management structure; the WFA represent fishermen's interests on WG fisheries and marine management groups and fishermen sit on the IFGs. However, there is little attention to implementing fisheries and marine management decisions at a local level. There is also a lack of information and data on the status of commercial fish stocks, the distribution and status of seabed habitats and wildlife to adequately inform marine ecosystem-wide management decisions. Informed by the necessary evidence, a local management group comprising all marine interests could deliver integrated fisheries and marine policy and management at a local level. The WFA would like to see a proactive approach to marine policy and management decision-making at a local level informed by accurate (as possible) knowledge of the status of our seas.

Pen Llŷn a'r Sarnau Special Area of Conservation (PLAS SAC)

In the early 1990's PLAS was included in a pilot project called the UK Marine SACs project which was looking at how we could manage our marine sites. The Relevant Authorities (as defined in the Habitats Directive) came together to manage the site and formed the Relevant Authorities Group. This group includes authorities that have a statutory duty within the marine environment e.g. local authorities, national parks, NRW, water companies etc. It is essential that these authorities work together as it is not down to any one authority to take a lead. It was determined by the Relevant Authorities early on that stakeholder engagement and involvement would be key to successful management. To this end the Liaison Group was established. This group consists of 24 representatives from different interest groups across the site including fishing, recreation and industry. Both the Relevant Authorities Group and the Liaison Group work together to manage PLAS. Once the UK Marine SACs project came to an end and the PLAS management scheme had been drafted, work on the site ground to a halt as no one authority committed sufficient resources to lead the work. It was determined by the relevant authorities that in order to take implement the action plan a dedicated site officer would be needed to co-ordinate the work on the site and move things forward. In 2003 Alison Hargrave was appointed the PLAS SAC Officer. Alison is the secretariat for both groups, acts as a main point of contact, coordinates work on the site and develops and runs projects to implement actions on the site. Alison also sets up specific steering groups to deliver specific pieces of work or projects. These steering groups will include any authority that is relevant to the piece or work and also any relevant stakeholders. So PLAS has a wealth of experience with regards to a co management approach. From experience PLAS knows that it is essential not only to engage with stakeholders but also to involve them in the decision making process. It is because of this experience that the SAC Officer agreed to manage the Marine Ecosystems Project.

The PLAS SAC has been designated for 12 specific conservation features. Therefore the management of the SAC is focused on these features and their components. The fact that we have

to focus on features only is often seen as a weakness in the SAC and SPA process. An EBA is important as you need to consider wider implications of issues affecting a site and the measures you put in place to address these issues. The marine environment is a complicated system that no one fully understands. PLAS SAC endeavours to take the whole ecosystem into consideration when addressing issues on the site. When possible we also look at more than just the issue at hand, we look at the area as a whole and in discussing solutions we also look at how we can help other areas such as the local economy.

The PLAS SAC does take both a co management and Ecosystem Bases Approach to a degree. Over twenty years of work has gone into managing PLAS and much of that has been through a co management process. It would be our recommendation that this work is built on and we learn from both what has worked and what hasn't worked on PLAS when developing the Marine Ecosystems Project.

8. c Welsh Government (WG)

We think this is a very positive initiative. We recognise that fishermen have a huge amount of practical understanding of the marine environment and a strong vested interest in safeguarding its future. We hope that this project will help bring together members of the fishing community and environmental interests to develop solutions to local problems in the seas around Llŷn. We look forward to seeing the outputs of the project and hope it will help us understand the benefits of co-management and shape future initiatives.

Natural Resources Wales (NRW)

The EBA is core to NRW's role and remit. The Environment Bill prescribes the approach that we must take, referred to as the sustainable management of natural resources (SMNR). The Environment Bill and the Future Generations Act will, taken together, effectively embed the 12 principles of the Ecosystem Approach set out by the United Nations Convention on Biological Diversity into Welsh legislation, and specifically require NRW to embed the principles throughout its work. In the marine environment, additional drivers for implementing an EBA exist, through the Marine Strategy Framework Directive and the UK Marine Policy Statement. We consider co-management to be a potential tool for implementing an EBA, which emphasises the importance of collaboration and engagement in management and decision-making.

Having the principles of EBA enshrined in legislation is an important first step. However, whilst the Environment Bill is not yet enacted, as an organisation we are developing new ways of working and improved approaches to help us embed the principles in what we do. Similarly, the implementation of marine legislation is still in its early stages. There are examples of implementation of specific Convention on Biological Diversity principles in marine management around Wales today. For example, there are a number of partnerships and liaison mechanisms to engage stakeholders in discussion and decision making about the planning and management of the Welsh marine area. We are beginning to move from a more sectoral and reactive system to a plan led system through the development of Wales' first National Marine Plan. However, it is widely recognised that implementing an Ecosystem Approach is challenging and it will be an iterative process of improvement as our understanding and experience grows.

We wish to work with partners to improve our understanding of how to implement an ecosystem based approach in the marine environment. We want to explore what this means in practice and how it can be delivered on the ground, particularly at a regional (sub-national) scale and through a co-operative approach to local decision making. We see the Llŷn Marine Ecosystems Project as a mechanism for doing this that can build on existing co-operative partnerships and working relationships such as the existing PLAS SAC management process. Through the Llŷn project, in the short term, we would like to be able to develop a common understanding of our existing knowledge about the marine habitats of the project area, start to address knowledge gaps, and explore options for a more integrated approach to marine management at a local level.

The North Inshore Fisheries Group (IFG)

The IFG (North) is a conduit between the fishermen of North Wales and national fisheries regulators. The members of the IFG (North) have an unparalleled knowledge of every aspect of their working environment and will be key players in contributing to the project. The present mechanism for interaction between the fishermen and the regulators does not allow for the adaptive management practices which the marine environment deserves. This "top down" approach cannot be sympathetic to the daily nuances of what is required to work in a sustainable manner.

Fishermen welcome this opportunity to partake in an ecosystem based adaptive "bottom up" co-management regime. They look forward to working with their fellow partners in the project to achieve the delivery of effective, consensual management and policy decisions informed by local knowledge and experience.

Fisheries Local Action Group (FLAG)

Importantly for the Welsh fishing industry and local communities, this approach will preserve their cultural and economic life, and secure traditional low-impact fisheries and recreational activities along with the related businesses. The aim of the Anglesey and Gwynedd FLAG is to support the fishing industry and associated communities through the delivery of a range of actions and activities by:

- Adding value to fishery products
- Encouraging diversification of economic activity
- Preserving and enhancing the environmental, cultural and social welfare
- Empowering the local fishing communities.

The Gwynedd and Anglesey FLAG have an underlying ethos to use a Community Led Local Development approach, in supporting the fishing industry and associated communities. Through its activities and actions, the FLAG aim to add value to fishery products, encourage diversification of economic activity, preserve and enhance the local environment, cultural and social welfare and empower the local fishing communities. This bottom up ethos is a vital part of the co-management and eco-system based approach adopted by this project, aiming at preserving the cultural and economic life of the area. It is through the local practical implementation of Government policy that will secure traditional low-impact fisheries and its related businesses, and recreational activities that this aim can be achieved.

Royal Society for the Protection of Birds (RSPB)

Co-management presents an opportunity for stakeholders to tackle issues in a pragmatic way. By engaging with the relevant sectors from the outset, we can ensure that people are brought along with any changes proposed. Further, stakeholders have the opportunity to not only input their views, but see them shape management options.

Marine Conservation Society (MCS)

Traditional management of sites has focused on the conservation features through conservation objectives but these have not all been successful, with over half marine sites failing to reach the legally required 'Favourable Conservation Status'. With further legislation of the EU Marine Strategy Framework Directive, with its target of 'Good Environmental Status' by 2020, and the national Well Being for Future Generations (Wales) Act 2015, with its goals of 'a globally responsible Wales' and in particular 'a resilient Wales', there has never been a greater need to develop an EBA to marine conservation management. Not only do we need to maintain these sites but also to restore them to ensure they are resilient and future proof, whilst taking into account social, economic and ecological needs. With limited resourcing to cover monitoring, management and enforcement, we increasingly rely on stakeholders, as well as Regulating Authorities, to help deliver these goals. However this can only be achieved if there is sufficient stakeholder engagement to ensure understanding, and with that compliance, to all work towards an ecosystem based approach.

Appendix 6.b Fishermen Focus Group Minutes

Llŷn Marine Ecosystems Project

Note of fishermen's meeting held at Botwnnog 16th September 2015, 6.30pm – 9pm

Background to the project

Jim Evans, Director Welsh Fishermen's Association started the meeting by explaining the background to how the Llŷn Marine Ecosystems Project (also referred to as the Llŷn Ecosystems Based Approach (EBA) project) came about:

- Welsh fishing industry's response to the Welsh Government highly protected Marine Conservation Zone proposals, 'Striking the Balance' set out proposals for an adaptive, ecosystem-based approach to managing fisheries and the marine environment; supporting co-management, building resilience in, and promote recovery of marine ecosystems, and supporting a more integrated approach to management.
- The Llŷn Marine Ecosystems Project aims to try and take forward these proposals in the sea area around Pen Llŷn.
- A number of challenges facing the fishing industry in Wales in terms of other areas of work within the Welsh marine environment that will have various implications for fishermen, such as:

- Marine protected areas: e.g, new proposals for Special Areas of Conservation (SACs) for harbour porpoise and Special Protection Areas (SPAs) at sea for a variety of bird species; assessing coherence of the marine protected area network in Wales
 - Measures under the Marine Strategy Framework Directive (MSFD) that Wales will need to report on relating to sustainable fishing and the health of the marine environment
 - Assessment of marine fisheries in SACs and SPAs in Wales
 - The first marine plan for Wales
 - CFP and requirements for MSY (maximum sustainable yield) and landings obligations
- Managing the marine environment and marine fisheries through an ecosystem based approach will support a basis for delivering sustainable fisheries as well as meeting obligations such as those described above.
 - The Llŷn Marine Ecosystems project is an opportunity for the fishing industry to input to delivering this and securing the health and sustainable use of the marine environment.

Jim thanked the project partners and those who have supported the setting up of the Llŷn Marine Ecosystems Project. He explained that Catrin Glyn's role as the project officer is to work with local fishermen to help identify how the fishing industry and play their part in delivering and ecosystem based approach.

Introduction to the project and what the meeting was for

Catrin Glyn, project officer for the Marine Ecosystem's Project provided a brief introduction to the project and the aim of the meeting:

- The project is about joint working to explore what an ecosystem based approach to managing fisheries and the marine environment around Pen Llŷn means
- Local fishermen have a key role in determining how they think the project should develop and to take forward the project.
- The aim of the meeting is to start a conversation about four areas of the project and what fishermen's views are on these:
 - Co-management
 - Ecosystem based approach
 - Marine litter
 - Pingers (equipment to deter entanglement by marine mammals in fishing gear)
- There's no right or wrong answer – the project wants to explore these issues with fishermen.

The rest of the meeting considered these areas of the project in turn.

Catrin explained that there is also another element of the project – producing a code of conduct for sea users of the local area. There had been a separate drop-in day held for people to input their views and discuss this so this wasn't specifically going to be discussed at the meeting.

a. Co-management

Catrin introduced this by briefly described the existing arrangements for management of fisheries in Wales:

- Welsh Government (WG) are responsible for managing sea fisheries in Wales.
- There are a number of groups that work with WG on this, such as WFA, FLAG, IFG, Fishermen's Associations, SAC partnerships such as that for Pen Llŷn a'r Sarnau SAC which has commercial fishermen on the liaison group and is working closely with the Llŷn Marine Ecosystems Project.

Catrin explained that this part of the project is looking at what fishermen's views are on co-management, such as what this means, whether the existing management of fisheries in Wales delivers this already, whether other things are needed.

The discussion around co-management raised a number of issues and comments:

- The highly protected marine conservation zone proposal had ignored the needs of fishermen and the involvement they had been having local fisheries management
- Fishermen were concerned about giving their views on things in case they are used against them in the future
- When fishermen give their views they feel that no one is listening
- A large number of specific issues relating to current fisheries were raised and queries about what was happening with decisions about the management of these.
- Concerns raised about the slow rate of progress in addressing specific issues that have been raised by fishermen.
- Concerns raised about levels of fishing effort. Also concerns re hobby fishers and non-licensed fishing but where catch still being sold.
- Not clear what research that has been done is telling us.
- Concern about future stocks for fisheries and what information is available about juveniles.
- A general fishing license doesn't give anyone jurisdiction over a specific area for fishing.
- There will be greater requirements for fisheries to be able to demonstrate what impact it is having and whether it is sustainable, e.g. under the European Marine Strategy Framework Directive and the Wales Future Generations and Wellbeing Act.

In response to some of these comments the following points were made:

- The Llŷn Marine Ecosystem Project is trying to address what happened previously with fishermen's views not being considered
- There are different views as to what an ecosystem based approach means. This project is an opportunity to trail what it means in practice within the existing framework of legislative process.
- The project is working towards an approach where there is more open discussion and agreement about what is needed. It is an opportunity for local people to have a strong voice within the existing regulatory framework. It is a chance to show that things can work at a regional level within a framework of co-management.
- Welsh Government are doing some work on what co-management is, but need to determine what co-management can actually be at a local level. It is important that people engage with this. It is an opportunity to help shape the future of co-management and establish a framework for the future.
- If agreement can be established at a local level then this is an important message to be able to communicate to Welsh Government.

- The Menai Strait Fishery Order Management Association is one example of how different parties can come together to be involved with fisheries management. Issues are taken to Welsh Government from this group. Could think about adapting this approach to your local area.
- Need to determine how fishermen want to take forward co-management. Need to determine what you're prepared to put into this. Otherwise other people will decide what happens.
- Need to ensure that there are opportunities for younger fishermen who are coming into the industry.
- There needs to be greater openness about evidence supporting particular viewpoints.
- Clarification about the current situation regarding proposed new management measures was provided.
- Work to address current fisheries issues was underway. Some of this was complicated by the legislative framework that Welsh Government is having to work with. Proposals that have been made by fishermen in response to fisheries issues and consultations are being considered and there will be consultations on proposed management measures coming out.
- There is research underway on a number of matters relating to fish stocks.
- There is a lot more focus on issues on the land. The regulatory requirements at sea are no less important but not necessarily seen as important as matters on the land.
- Fisheries is not a big industry in Wales and is not necessarily top of the political agenda.

b. Ecosystem Based Approach

Catrin provided a brief introduction to this topic:

- This is a complex topic but is essentially about how the wider marine environment is considered when making decisions about particular activities
- For example, how an issue that occurs in an area and is focussed on just one thing can actually have an effect on a number of different things over a wider area.

Catrin explained that this part of the project is looking at what fishermen's views are on the wider marine ecosystem and if, and how, they think this is considered in fisheries management and by individual fishermen.

The discussion around co-management raised a number of issues and comments:

- If take too many things out of the sea it can affect other factors. Too much fishing effort is an example.
- If there isn't an ecosystem fishermen don't have a living. Fishermen have seen the result of too much fishing in the past in some fisheries.
- Collating evidence of fisheries and the wider ecosystem can be a problem.
- No clarity over how much fish/shellfish is actually landed from the local area, taking account of hobby and non-licensed fisheries at sea and along the coast.
- Fishing gear is being stolen and no-one is doing anything about it.

In response to some of these comments the following points were made:

- Local fishermen are well placed to identify issues that they are concerned about in terms of fisheries and the wider marine ecosystem.

- Hobby and non-licensed fisheries will need to be assessed as part of the assessment of marine fisheries in SACs and SPAs that was mentioned at the start.

As time was short the discussion moved on to the other two areas under discussion at the meeting. Catrin asked people to get in touch with her if they had other comments to make.

c. Marine Litter

Catrin explained that this area of work is to better understand the issue of marine litter around Llŷn, whether there is a problem with litter in this area, and any issues the fishermen had in relation to litter, including any need for specific disposal facilities. She explained that the original idea behind 'Fishing for litter' was more aimed at some mobile gear fisheries where rubbish gets picked up as part of the fishery and support was being provided to fishermen to dispose of this. The local fisheries around Llŷn are

The following comments and issues were raised in relation to litter:

- Tend to only see litter on the beaches, so generally only see things carried in on the tide
- Some litter is encountered by fishermen at sea and can include bits of net or plastic bags.
- Some litter washing up locally comes from a long way away, e.g. America
- Litter not seen as a major problem in the sea around Llŷn
- There is a lot of evidence to say that litter generally is a problem.
- Beach litter surveys in the UK over the past 20 years have identified a high proportion of the litter coming from fishing. Concern that this points the finger at the fishing industry and all are implicated even if not generating the litter.
- The UK survey data for litter needs to be considered as to how it relates to local issues and how much might be generated locally. This is something that this group could input to.
- Concerns around litter from fisheries also include concerns about ghost fishing of lost gear.
- It's in fishermen's interests to dispose appropriately of any litter that they encounter or produce. Can dispose of it through the council's facilities, e.g. council skip
- Litter, generally, is a problem for everyone as there is a lot of it and its not going away.
- There is concern generally over the breakdown of plastics into small particles (micro-plastics), these being eaten by marine creatures and possible transfer of chemicals through the food chain. Current evidence does not show dangerous levels of chemicals in animal tissues, but concern about accumulation.
- Litter can get into the sea if not disposed of properly on the land.

In response to some of these comments the following points were made:

- There are initiatives underway looking at recycling old fishing material, e.g. netting, to grind it down and recycle into other products. Some work with groups in Milford Haven looking at this through joint working with the World Animal Fund. Local fishermen are well placed to identify issues that they are concerned about in terms of fisheries and the wider marine ecosystem.
- In recognised ports it is the local authority's duty to provide waste disposal facilities
- Might be worth considering a code of practice for the fishing industry in relation to litter, to demonstrate action from the industry to tackling the litter issue.

- Would be useful to get fishermen's perspectives on how litter is being categorised in the beach litter surveys. If some fishermen were willing to come out to a beach locally and work through the survey with people who do the litter monitoring would provide a useful quality assessment of what sort of litter is being linked to fisheries, and identify if the guidance for beach litter surveys could be improved in terms of how litter that is being attributed to fisheries is recorded.

d. Pingers

Catrin introduced this final topic explaining that:

- Pingers are equipment that is used to deter marine mammals from getting close to fishing nets in order to reduce the likelihood of entanglement of marine mammals in fishing gear.
- The initial proposal to look at this as part of the project had come from the fishing industry but it wasn't clear how much of an issue this was for the fisheries around Pen Llŷn as primarily pot fishery.
- The aim of this part of the project is to find out if it is considered that entanglement of marine mammals is an issue in the Pen Llŷn area and whether the use of pingers on nets should be considered further.

The following comments and issues were raised in relation to pingers:

- Questions regarding beach set nets and concerns over the scale of beach netting around Pen Llŷn which is viewed by some as a persistent problem.
- Queries as to whether the catch from beach set nets could be sold and whether any restrictions on this.
- Possible use of pingers on nets considered as a possible mitigation measures against risk of nets to entanglement of marine mammals. Some work has already been done to look at how useful they are and a report is being produced as part of the Llŷn Marine Ecosystems Project.

In response to some of these comments the following points were made:

- There are measures being considered to provide better regulation of beach set nets and issue of traceability of the catch being sold.
- Some legal issues that need to be resolved as commercial fisheries licence only relates to netting from a boat.
- Suggested that the report on pingers is used as a basis to look further into what, if anything, needs to be done locally around Pen Llŷn in relation to pingers.
- Would be useful for fishermen to consider whether they would be interested in using pingers on their nets if they fish with nets. Whether they think this could be helpful

Next steps

- A note of the evenings meeting will be circulated to everyone.
- Catrin explained that the project will produce a report on each of the 4 topics discussed at the meeting. These have to be finished before the end of March next year as funding for the project is currently only until the end of March. The aim is that the content of the reports

comes from the local fishermen so it reflects what they think the issues are and suggestions as to how they could be addressed.

- Catrin
- As the meeting had only been able to introduce and briefly discuss the topics, it was agreed that it would be useful for Catrin to arrange to talk further with individual fishermen. If anyone would like to talk to her on any aspects of the project they should feel free to get in touch with her.
- It was proposed there is a further meeting with fishermen in a few months time to discuss the findings of the project to date before the reports are produced.
- Jim explained that the project had a steering group who were working with Catrin to help take the project forward; this group had a number of representatives from the fishing industry (Brett Garner, Sion Williams, Trevor Jones and Jim), so fishermen could get in touch with these individuals as well to discuss aspects of the project if they would like to. Fishermen were encouraged to work with their local fisheries representatives and feed into the project.

Appendix 6.c Summary of the fishermen's views on Co-management and EBA from the one to one meetings

The Marine Project Officer undertook the one on one meetings and visited 7 fishing vessels (10 fishers) in the areas of Pwllheli, Abersoch, Porth Neigwl, Porth Colmon, Porthdinllaen and two more in the North of Llŷn. Due to time constraints, it was not feasible to undertake face to face meetings with all fishers in the project area. However, the sample taken provides a good geographical range around Llŷn.

The main worries and points regarding co-management and EBA were as follows:

- the amount of unlicensed netting that takes place in Llŷn is detrimentally high,
- lack of monitoring on unlicensed netting in Llŷn is a problem,
- educating and enforcing should be increased (recreational),
- the unknown effect of ghost fishing in Llŷn should be addressed,
- there is a decrease in the size of lobsters on the ground due to the amount of effort and fishers having to work more gear to catch less, with ever increasing costs, and the price of lobsters having been static for the last twenty years,
- a dramatic decline in sightings and landings of crawfish over the last 40 years,
- the fact that there are no restrictions on the number of lobster/crab and whelk pots is a worrying factor in Llŷn.
- restrictions on lobster and whelk pots (per boat) should be delivered.
- in terms of scallop dredging, curfews and week end ban should be implemented.
- fishers have tried to voice their opinions in the past but to no use.
- WG is very much behind when it comes to managing, monitoring and prosecuting.
- co-management should be in balance with the user, accurate and science-based evidence should be the basis of everything. Boats are businesses, which need to make a living for fishermen. Commercial fishermen expect that the fishery is managed sustainably to be able to earn a living from the fishery throughout the year.
- co-management should be all coastal users having a say. Commercial fishers do have to be at the top of the spectrum along with the likes of NRW. These two bodies hold most of the information, whether current or historical. But you have tourist boards and other activities such as angling, but these are leisure related, but bring much needed revenue to the area, so they need to be at the table.

Appendix 6.d Individual Project Reports

- i. Fishing for Litter - a feasibility scoping study in Llŷn
Produced in September 2015, by the Marine Conservation Society**

Introduction

The Marine Ecosystems Project is a pilot project located in Pen Llŷn and is an evolution of the work of the Pen Llŷn a'r Sarnau Special Area of Conservation (SAC). The project is a result of a document formulated by the Welsh Fishermen's Association (WFA) which proposed a method of managing the sea that would improve our understanding of the marine environment and promote the recovery and resilience of ecosystems without having a detrimental impact on local fishermen and communities. A method that would safeguard cultural and economic life and protect traditional fisheries and recreational activities. Therefore, the Pen Llŷn a'r Sarnau SAC and the WFA jointly lead the Marine Ecosystems Project, a project that reflects the fact that conservation and the fishing industry can go hand in hand and places great emphasis on joint management and consultation.

As well as looking at different options for more integrated management the Marine Ecosystems Project is looking to tackle some of the issues identified by the Pen Llŷn a'r Sarnau SAC to demonstrate how stakeholders can get involved in the process and the solutions. The Pen Llŷn a'r Sarnau SAC has identified a number of issues affecting the condition of the SAC. One of these is marine litter. This report is a scoping study to investigate the possibility of developing a fishing for litter project on Llŷn or whether another approach may be needed.

This report includes:

- An introduction to the fishing for litter concept
- A summary of other UK fishing for litter projects
- An initial outline of the situation in Llŷn
- Recommendations and next steps

Fishing for Litter

The Fishing for Litter concept in essence is a simple and effective one. Local fishermen are given bags to collect waste that they bring up during normal fishing activities. They are then able to dispose of or recycle this waste free of charge at participating ports. The waste collected is monitored to try and pinpoint to source of most of the litter and thereby provide potential solutions.

The Beginning of Fishing for Litter

The fishing for litter initiative originated in 2000 through the N. Sea Directorate of the Dutch Government together with the Dutch Fisheries Association. The original pilot schemes were run by the organisation Kimo International as part of the Save the North Sea project in Scotland, Sweden, Netherlands and Denmark until 2005.

Kommunenenes Internasjonale Miljøorganisasjon or the Local Authorities International Environmental Organisation is an association of coastal local authorities whose goal is to eliminate pollution of all types, including litter from their seas. There are around 75 member authorities in 10 countries, United Kingdom, Sweden, Denmark, the Netherlands, Belgium Lithuania, Estonia, Germany, the Faeroe Island and the Isle of Man. Each country has its own national Kimo network. At present all the UK members of Kimo are in Scotland.

Benefits

Reducing the amount of litter at sea is of immediate benefit to fishermen themselves through reduction in contaminated catches and time lost to remove litter or repair nets or boats damaged by litter. It is also of benefit to the local coastal communities. If less litter is washing ashore then fewer resources, time and money are wasted collecting and disposing of litter. Communities may also benefit through cleaner and more appealing beaches encouraging an increase in tourism. There is also evidence that micro-plastics (plastics broken down into minute particles or tiny plastic particles that are used in things such as some beauty products) are increasing in the natural environment. In the marine environment these are being ingested by marine animals from plankton through to larger marine species. There is the potential for contaminants from plastics being transferred to species higher in the food chain. It is in everyone's interests to try and reduce the volume of plastic that enters the environment.

Fishing for litter schemes can also raise awareness of the general problems caused by marine litter, not only to the fishing industry and local communities but also to all those involved in such projects, e.g. port/harbour authorities, waste disposal companies, local councils, recycling companies and bag suppliers.

Marine Strategy Framework Directive – a legislative driver

The Marine Strategy Framework Directive (MSFD) is a high-level EU framework Directive which requires Member States to achieve Good Environmental Status (GES) in their marine waters by 2020. The Directive came into force on 15th July 2008.

The MSFD was fully transposed into UK law on the 15th July 2010. This put in place a clear legal framework for the implementation of the Directive by 2020.

Litter forms one of the 11 qualitative descriptors that need to be monitored. For litter the MSFD states that: *'Properties and quantities of marine litter do not cause harm to the coastal and marine environment'*

The UK is also a member of OSPAR which is formed of 15 Governments around the North East Atlantic who together with the EU aim to protect the marine environment. The OSPAR regional Action Plan for marine litter specifically refers to Fishing for Litter schemes in its Theme C removal section and this was reiterated in the recent UK consultation on a Programme of Measures to reduce marine litter.

Special Areas of Conservation (SACs) are designated under the EU Habitats Directive. Marine litter is noted as an issue for these sites and as effecting both condition and conservation status of Welsh SACs. The LIFE Natura 2000 Programme in Wales, a project developing a strategic plan for management and restoration of SACs and Special Protection Areas for birds has identified marine litter as a priority issue and risk affecting marine SACs in Wales.

(RAP <http://www.ospar.org/documents?v=7370>)

(<https://consult.defra.gov.uk/marine/msfd-programme-of-measures>)

(<http://www.naturalresources.wales/about-us/our-projects/life-n2k-wales/life-n2k-thematic-action-plans/?lang=en>)

The problem of litter in the marine environment

Marine litter has been defined as “any persistent, manufactured or processed solid material discarded, disposed or abandoned in the marine and coastal environment” (UNEP 2009) and it has been estimated that 6.4 million tonnes of litter enter the oceans every year.

The amount of litter in our seas and on our beaches continues to be a cause for concern. Beach litter surveys indicate that, in general, quantities of litter on UK beaches have increased by almost 90% since 1994, with the density of plastic increasing by 135% in the same period (MCS 2015). Average litter densities on UK beaches are now over 2,000 litter items/km surveyed.

The United Nations Environment Programme states that “marine litter poses a vast and growing threat to the marine and coastal environment” (UNEP 2005). If no action is taken litter will continue to accumulate and increase in the marine environment and on our beaches. This will affect wildlife, ecosystems, the tourism and fishing industries and the UK taxpayer.

Costs

Marine and beach litter is not simply an aesthetic problem, but has environmental, ecological and socio-economic impacts. Coastal communities, many of which rely on the marine environment for their livelihood through tourism, fishing and recreational water sports, continue to pay the price for marine and coastal litter. Revenue is lost through spoilt fish catches, damage to boats and nets, lost tourism income and damage to

property. Sewage-related debris on beaches can have adverse effects on tourism. Local authorities, and ultimately taxpayers, bear the huge financial burden of clearing litter from UK beaches. It has been calculated that the UK spends approximately €18 million (around £13million) removing beach litter every year (KIMO, 2010).

Fishing

Marine litter results in lost revenue for fisheries, due to the time and effort involved in sorting debris from the catch, while larger items may damage or entangle fishing gear. Fouled propellers and pierced hulls caused by litter can also endanger human life if vessels cannot be operated. A survey of fishermen in Shetland reported that 92% had accumulated marine debris in their nets; 69% had had their catch contaminated and 92% had snagged their nets on debris on the seabed (KIMO, 2000). Costs associated with the time dealing with marine litter to the Scottish fishing fleet are between €11.7million and €13 million per year (KIMO, 2010).

Commercial fishing interests can be affected when fisheries resources are depleted by 'ghost fishing', where lost or abandoned nets and traps continue to capture target and non-target species long after the nets have been lost or discarded at sea or on the seabed. This also reduces reproductive potential, as the nets may capture immature fish that have not yet produced offspring.

Even when the lost nets sink from the weight of their 'catch', the persistent nature of the plastics from which they are made means that they can continue to damage the seabed and affect commercially important shellfish species for many years. An estimated \$250 million in marketable lobster is lost every year due to ghost fishing (Global Marine Litter Information Gateway, 2004).

Fishermen report that plastics foul propellers and that plastic bags and sheeting clog seawater intakes and evaporators, causing engine failure, costly repairs, and delays. This type of vessel disablement can be life threatening. In the 10 years (2002-11) RNLI Lifeboats were launched 7,049 times in total to commercial fishing and angling vessels. Out of these, 2,124 (30%) were attributed to a fouled prop (RNLI pers. comm. 2012), although not all of these may have been due to litter.

Wildlife

Wildlife suffers from marine litter from entanglement in or ingestion of marine litter, smothering of substrates or rafting of organisms on litter. Gall & Thompson (2015) reported that to date 693 species have been affected by litter. They also reported that 92% of encounters with litter were with plastic. Plastic rope and net were the types of litter most found in entanglement and plastic pieces in ingestion.

All species of turtles and more than half of all marine mammals and seabirds species have been entangled in or ingested marine litter. 17% of these are on the IUCN Red list as near threatened, vulnerable, endangered or critically endangered (Gall & Thompson 2015).

Larger items can physically trap animals, which can lead to drowning in air breathing species such as turtles, cetaceans and seals or to the asphyxiation of fish species. The extra energy needed to drag around items of litter can lead to increased risk of predation, starvation and death. Litter can also become tightly bound around the body or extremities, causing fatalities or limbs and wings to be severed

When litter is indigested it can cause physical damage to the digestive tract, which may lead to scarring, ulceration and occasional penetration in to the body cavity. Ingestion can also cause a blockage or affect appetite by giving the animal a false sense of satiation. Seabirds confuse small litter items with food and, as they regurgitate their food when feeding their young, they can pass these directly to their chicks.

Sub lethal effects of plastic ingestion and entanglement include difficulties in feeding and a decreased ability to survive and/or reproduce and increased energy needed for swimming. These are difficult to quantify, but are probably more common than lethal effects (Ryan, 1990; Pemberton et al.,1992).

Microplastics

There are two main types of microplastics. Primary microplastics are from products such as toothpaste and facial and body scrubs or fibres from synthetic clothing being washed down our drains. Secondary microplastics are formed by the breakdown of larger plastic fragments. As such it can be expected that the amount of microplastics can only increase over time. Because of their size microplastics can be eaten by all forms of marine organisms.

Worryingly, recent studies have shown that microplastics, can adsorb toxic chemicals from their surroundings, or leach out toxins such as flame retardants and plasticizers. Since these microplastics can be ingested by animals towards the bottom of the food web, the potential exists for these toxins to bioaccumulate and be passed to ourselves as sea food consumers. This is an area of ongoing research.

Existing schemes in the UK and Ireland

Scotland

The Scottish Fishing for Litter project has continued on from the original Save the North Sea project and is coordinated by KIMO UK. Most of the schemes monitor litter using the Scottish Monitoring sheet (See Appendix 1)

Aims

- Deliver Scottish Marine Litter Strategy aims
- Direct removal of litter from the sea
- Raising awareness of marine litter issues
- Reducing the impact of marine litter on the fishing sector
- Improving the marine environment

General information

- Number of harbours - 15 all the way round Scotland
- Number of boats – 214
- Most participating boats in Scotland are demersal trawlers but the larger pelagic boats also participate

Results

- 52% of the items found in the bags was categorized as Plastic or Polystyrene
- Litter collected (tonnes) since start of project (2005) – 880

Future targets to March 2017

- 20 harbours
- 300 boats
- 1200 tonnes collected

Costs

- Costs about £100k/year to operate

Funders

- Over the years has had a number of funders, at present Aberdeenshire Council, The Scottish Government – Marine Scotland, Scottish National Heritage, Scottish Fishermen's Trust, the Crown Estate, John Lewis, Beatrice Offshore Windfarm Ltd, Seagreen Wind Energy, Total E&P, Peterhead Port Authority, Lerwick Port Authority, Scrabster Harbour, Ullapool Harbour Trust and Tarbert Harbour

How the project works

- The project buys large, strong bags and issues to the participating ports and harbour
- The port distribute the bags to fishermen on request
- The fishermen collect litter caught in their nets and deposit in the bag
- The fishermen land the bags on the quayside
- The port transfer the bags to a skip provided by the project
- The project arranges disposal of the litter to landfill

Challenges

- Finding recycling options for litter contaminated by being in the sea
- Need to make sure only litter from nets is collected in the skips and galley waste and other operational waste is not put in the bags
- Raising the funds

- Keeping it fresh and live
- Need to keep it fresh in everybody's mind

Links and contacts

- <http://www.kimointernational.org/Scotland.aspx>
- <http://resource.co/article/fishing-litter-removes-800-tonnes-waste-scottish-waters-9961>
- graham.humphries.kimo@aberdeenshire.gov.uk

Yorkshire/ Holderness

Coordinated by Yorkshire Wildlife Trust in association with KIMO UK and with the support of the Holderness Fishing Industry Group.

Aims

- To reduce the amount of litter in the North Sea
- To engage the fishing industry in the direct removal of and diversion of litter from the sea
- To raise awareness of the issues caused by marine litter
- To work towards long term, sustainable adoption of best practice across the Yorkshire fishing fleet in regards to marine litter

General information

- Number of harbours - 5, Flamborough North Landing, Flamborough South Landing, Hornsea Commercial Compound, Withernsea Commercial Compound, Withernsea Leisure Compound
- Number of boats: 24 + 2 beach netsmen
- Main type of gear used on boats - 99% potting here. Some gill nets for bass, sea trout and salmon

Results

- Main type of litter found – plastics - Net, line and food packaging
- Litter collected (tonnes) - Totals not yet available.

Future targets

- Establish recycling scheme for key litter items
- Engage more boats
- Expand area
- Seek long term funding and link more closely with other projects.

Costs

- £11k (but could have done it for £5k stripped back to less materials etc)

Funders

- European Union Fisheries fund, Marine Management Organisation, Holderness Coast Flag, East Riding of Yorkshire County Council

How the project works

- Via sacks taken aboard vessels, then emptied into bins which are emptied via a contract with the local authority, over 90% is diverted from landfill.
- The scheme pays for a council contract to provide and empty the bins at the main fishing ports
- Contamination of the bins is not a problem in the compounds that are fenced for use by fishermen only but the more publicly accessible sites can be problematic. Some of the bins have been padlocked with a combination lock which the fishermen then know.
- Litter is examined when possible. The Kimo survey sheet is used
- Over 90% is diverted from landfill and they are hoping to set up specific recycling schemes for some problematic items.

Challenges

- Fishermen engagement
- Logistics of a large area
- Funding

Links and contacts

- <https://www.facebook.com/pages/Fishing-4-Litter-Holderness/529287607173521>
- <http://www.ywt.org.uk/fishing-for-litter>
- kat.sanders@ywt.org.uk (01262 422103),

Northern Ireland

Launched in February 2014 by Northern Ireland's Environment Minister Mark H Durkan and Delivered by the Northern Ireland Fishery Harbour (NIFHA), The scheme was formally launched in Ardglass on 20 February 2014, extended to Kilkeel in September 2014 and Portavogie in September 2015.

Aims

- To maintain a network of harbours where participating boats can land marine litter (such as plastic bottles; string, food wrappers; carrier bags; and fishing debris)
- To change the working practices within the fishing industry to help prevent litter reaching the marine environment in the first instance.

General information

- Number of harbours - 2 Ardglass and Kilkeel. Portavogie joined 11 September 2015.
- Number of boats 116 (as at 8 September – likely to increase after Portavogie joins)
- Main type of gear used on boats – Twin Rig Prawn Trawls

Results

- Approx 24 tonnes collected to 8 September.
- Main Type Of Litter Found - Paint Cans, Creels, Tyres, Netting, Gloves, Traffic Cones, Rope, Wire

Future targets to March 2017

- Funding for the scheme will cease on 31 March 2016.

Costs

- Approx £11,000 over 2 and a quarter years

Funders

- Northern Ireland's Department of the Environment (DOE NI)

How the project works

- It is deposited in special skips on the quay and disposed of to landfill.
- Tipping bins at our harbours to collect the items which greatly reduces manual handling issues.
- The fishermen land the litter in the bags supplied to them and harbour staff collect as required.
- Litter kept in bags in waste compound until enough to fill a skip. Bags then tipped in and reused.
- Any useful items, e.g. rope, pots, etc are recycled.
- Any tyres landed have to be disposed of separately as special waste.

Challenges

- Funding is due to expire on 31 March 2016.

Further

information

1. Bags

- The bag supplier originally provided two sizes to NIFHA - 75 x 85 x 95 cm and 60 x 60 x 90 cm (Fig XX shows the 60 x60 x90 cm size). The smaller bag are more suitable for the boats taking part in the scheme as they occupy less space and are easier to handle when full.
- The bags open like mini builders bags and sit square or rectangular when supported. They have 45 x 30 cm loops on each corner, open hemmed tops and flat bottoms.
- The most cost effective way to purchase these bags was to source them overseas. From a printing point of view the minimum quantity was 500 bags / per variety.
- When the bags were supplied in early 2014 the prices were £2.10 and £1.55 + VAT respectively. Currently they may well be cheaper but new quotes would need to be obtained.

2. Other

- The odd small prize e.g. pack of gloves to the most unusual item brought in of names into a hat etc keeps the interest going !
- Won the Coca-Cola Coast Care Award for the Fishing for Litter Best Business Award in 2014.

Links and contacts

- DOE: Susan Cramer – susan.cramer@doeni.gov.uk
- NIFHA: Chief Executive – Kevin Quigley – Kevin.quigley@nifha.co.uk
John Smyth (Harbour Master Ardglass) john.smyth@nifha.co.uk
Michael Young (Harbour Master Kilkeel) Michael.young@nifha.co.uk
Eddie Robinson (Harbour Master Portavogie) edward.robinson@nifha.co.uk
- Bag supplier: David Martin and Son Ltd. Carrickfergus,. paul@dmsbags.com
 - <http://resource.co/resource-use/article/northern-ireland-launches-marine-litter-initiative>
 - <https://www.facebook.com/FishingforLitter>

Fishing For Litter South West

The SW project is a project under Kimo International. It is coordinated by Seafood Cornwall Training Ltd. Harbours are in Cornwall and Devon.

Aims

- To maintain a network of harbours and fishing vessels around the South West so participating boats can land the marine litter they've caught in their fishing gear
- To change the working practices within the fishing industry, to help prevent litter reaching the marine environment in the first place
- To highlight the impacts of marine litter

General information

- Number of harbours - 9 - Brixham, Looe, Newlyn, Newquay, Plymouth, Padstow, Mevagissey and St Ives, Hayle
- Number of boats – 160
- Type of gear used – mainly towed gear, Beam and Demersal, although all types and sizes of boat participate.

Results

- Litter collected (tonnes) since start of project in 2009 - 120

- Type of litter found - The volume of lightweight plastic items is much higher than initially anticipated; forming 88% of all items surveyed during the last phase of the project. The overall tonnage of marine litter recovered by fishermen in Cornwall and Devon is considerably higher, since some items with a value e.g. scrap metal are often segregated out

Future targets

- To maintain the existing network of 9 Fishing for Litter harbours in SW and involve an additional 3 creating an overall network of 12 in the South West.
- The involvement of 200 vessels in the project.
- The collection of 100 tonnes of marine litter during 2014 - 17.
- Production of information aimed at fishermen and fishing communities to highlight the origin and impacts of marine litter to encourage best practice.
- Work with Seafish / MCA approved training providers to incorporate marine litter content in courses aimed at new entrants and experienced fishermen, in order to reinforce the project's objectives.
- Produce educational materials and educational website pages to work with school children and the general public to highlight the origin and impacts of marine litter.
- Monitor the waste in each skip twice a year, to provide policy makers with the type of litter.
- Submit the UK SW FFL data to OSPAR annually.
- Produce promotional materials, attend promotional events, and undertake PR & marketing.
- Produce 6 monthly progress reports and a final project report with a detailed waste analysis.
- Work with local authorities and waste companies to investigate and identify any materials suitable for recycling or reuse. Discussions are on going regarding this issue.

Costs

- Based on 1 part time coordinator (2.5 days per week) and 2 part time liaison officers (1 day each per week) plus all waste and marketing costs (including printed materials, video production and new website), the project costs between 60-90k per annum to run.
- Waste costs are high - project has 5 skips and 4 wheelie bins .Skips costs £300 to service approx 1 x month,
- Budget for waste is approx 30k per annum.

Funders

- The Cornish Fish Producers Organisation, The South Western Fish Producers Organisation, Natural England, The Environment Agency, The Crown Estate, The Esmee Fairbairn Foundation, The Duchy of Cornwall, DEFRA, Cornwall Council, North Devon Council and European FLAG funding (Axis 4 EFF).

Challenges

- Sourcing ongoing funding
- Encouraging ongoing engagement
- Ever increasing waste costs and landfill tax

How the project works

- Participating vessels are given hardwearing bags to collect marine litter caught in their fishing gear while undertaking normal fishing activity.
- Filled bags are deposited on the quayside and staff at participating harbours then move the bags to dedicated skips for monitoring, collection and disposal.
- To avoid contamination, each bin or skip is locked and the fishermen provided with the combination or the harbour staff remain responsible for loading filled bags into secure skips.
- Annual surveys of each skip / bin are undertaken using the Kimo Survey Sheet and each harbour master monitors the bin / skip on a regular basis to ensure compliance by fishers.
- Where possible items are separated out for recycling. If not suitable the waste goes to landfill at present

Further information

- The Fishing for Litter scheme helps vessels meet the Responsible Fishing Scheme (RFS) requirement to reduce marine litter.

Links and contacts

- <http://www.seafoodcornwalltraining.co.uk/fishing-for-litter/>
- <http://www.kimointernational.org/WebData/Files/FFL%20South%20West/Fishing%20For%20Litter%20SW%20Newsletter%20Spring%202014%20web.pdf>
- This short video explains the scheme: https://www.youtube.com/watch?v=N3A-N_yofv4
- Email: sarah@seafoodcornwalltraining.co.uk

Ireland

The Irish scheme is taking place in the West of Ireland in County Cork. It is coordinated by Bord Iascaigh Mhara (BIM) together with Cork County Council, the port harbourmasters and Responsible Irish Fish.

Aims

- Develop a framework of local solutions for marine litter removal, promotion of sustainable fishery practices (Environmental Management System), improving knowledge on marine litter in the area.

- Develop a multi-sectoral partnership on marine litter removal, with a comparable and transferable approach on marine litter removal (from retention to treatment).
- Enhance awareness raising, dissemination and capacity building on marine litter removal.

Results

- Harbours – 3: Castletownbere, Dingle, Unionhall.
- Boats –
- Litter collected (Tonnes) -
- Pilot litter retention activities conducted by BIM ahead of the regional workshop
- BIM presented MARELITT and the new marine litter retention project at the Clean Coasts Symposium & Ocean Heroes Awards, hosted by The National Trust for Ireland on 19 November 2014
- Workshop report 2013
- BIM intend to use the project as a means of complementing the existing Responsible Irish Fish EMS, which includes an action on participating in marine litter projects, such as fishing for litter projects, if available. The EMS has been adopted by 120 vessels, with 80 vessels achieving accreditation. The project would include one fisherman as an industry-to-industry peer mentor and would be based in Castletownbere. BIM gear tech trials could also be used as a pilot activity to explore any practical barriers of implementation and demonstrate the feasibility to operators. Possible funding sources may include FLAGs, EMFF (Axis 4), private funding.

Links and Contacts

- <http://www.marelitt.eu/index.php?s=16&sub=34>

Summary of other Fishing for Litter UK projects

As expected, given that all projects have different funders and aims, there is a variety of methods used. Fishing for litter projects are not cheap to run and require resourcing for dedicated project officers, provision of skips and waste disposal. Costs vary between £11-100K per annum depending upon the scale, number of ports/harbours and number of participating vessels. However, all schemes demonstrate that there is a large amount of litter which can be removed from the marine environment by fisheries whilst they undertake their normal duties if provided with the means to do so. The schemes are established in every UK country but Wales. Beach litter figures show that Wales has, on average, higher amounts of beach litter than the other countries and that the percentage of fishing related litter is usually higher than average. In considering these figures it has to be borne in mind that much of the Welsh coastline faces prevailing westerly/south-westerly winds and that not all the beach litter items are from local sources. However, the large volumes of litter are of concern and highlight the need for action to tackle the problem which could, amongst the possible options, include a Fishing for Litter scheme in Wales.

http://www.mcsuk.org/downloads/pollution/beachwatch/latest2015/MCS_GBBC_2014_Report.pdf

Situation on LIÿn

This section explores what the issue is locally on LIÿn from the perspective of the local fishing industry. In order to gather this information a number of different methods were trialled:

- Focus group meeting
- Electronic questionnaire
- One to one meetings

Focus Group Meeting

A focus group meeting was held to discuss the Marine Ecosystems Project in its entirety. A section of the meeting was dedicated to the fishing for litter project. The meeting had a good turn out with approx. 20 people attending. The discussion was productive with some clear indications of problems that the group could tackle in the future. However, it was difficult in that setting to get information in the detail and quantity required for the fishing for litter project.

The main feedback from the focus group meeting was that the fishers didn't encounter that much litter whilst out at sea. They also didn't encounter that much litter in their gear. Most have bins on-board for self-generated litter. They also mentioned that they bring litter ashore and dispose of it for free in the skips / bins at the local ports and landing sites.

However, they did accept that litter is an issue as they can see it washed up on the shore. They also stated that they would be happy to help if we develop a project that might help tackle the litter issue.

A number of fishers at the meeting asked how MCS categorise beach litter in their surveys. They expressed an interest in having a member of MCS demonstrate how this is done and how fishing litter is categorised. They also asked if it would be possible for MCS to separate commercial and recreational fishing litter in their surveys.

Electronic Questionnaire and one to one meetings

The questionnaire that was sent out was a pilot questionnaire. The aim of the questionnaire was to:

- Test the survey methodology
- Test the delivery mechanism
- Receive feedback on the questionnaire
- Establish which areas fishermen were happy to respond to

The questionnaire was sent to 2 fishermen for comments prior to wider circulation then promoted at the focus group meeting mentioned above. 7 fishers responded to the questionnaire. Due to the low number of respondents it was concluded that one to one meetings might be more productive. A decision was made to enlist the help of the Marine Ecosystems Project Officer to undertake the one to one meetings. Due to time constraints 10 of fishers were met, however they do provide a good geographical range around the LIÿn.

The responses demonstrated there is a mixed fishery in the sample site, used by recreational and commercial fishers, using a variety of fishing gear types. All respondents bring any litter ashore to the port skip facilities, along with any damaged gear to be disposed of. All 5 ports have free skip facilities and recycling available at some

The majority of litter seen by the Llŷn fishermen are plastic floating items, which are reported as occasionally or rarely seen. Plastic bags, bottles and food packaging reported as the most frequently seen.

Key Findings and Recommendations from the surveys

This report is based on a scoping study to look at the issue of marine litter around Llŷn and determine whether there is a need for a pilot Fishing for Litter project in Llŷn. The recommendations below arise from research into the concept of the Fishing for Litter model, review of other similar schemes elsewhere in the UK, and questionnaires and face to face interviews with local fishermen.

As a background to the findings and recommendations from the study a number of key points about the local fishery arising from the project are relevant in terms of where effort to address marine litter issues locally might best be focussed:

- The primary fishery on Llŷn is static gear (potting for lobster and crabs)
- There isn't much netting (but there are anecdotal comments that some sorts of netting (e.g. beach set netting) are increasing)
- The fishery is undertaken mostly from small boats which might raise issues in terms of use of fishing for litter bags
- There are a few dredgers operating but they fish outside of the SAC further offshore. Very little trawling is undertaken within the SAC
- Fishermen will fix and re fix gear before eventually throwing it away when they can no longer fix it, so there is a strong emphasis on re-using materials where possible.

A fishing for litter project in Wales?

The reports indicate that the source of litter and removal from the sea is a complex one and further research is needed. It is clear from the existing projects around the UK that the Fishing for Litter concept has been able to engage with and support fishermen to remove litter from the marine environment whilst they undertake their normal duties. There are benefits from projects seeing themselves as part of a bigger UK-initiative and able to share ideas and information. Projects of this kind should include both commercial and recreational fishermen, as they use different scales of gear which may influence what and where they see or collect litter.

Whilst the questionnaire and one to one surveys showed that local fishermen are concerned about marine litter and recognise that litter is a problem, on the whole Llŷn fishermen encounter very little litter in their fishing gear. This is most likely because the static gear which is primarily used around Llŷn is less likely to entrap litter. Even fishermen who use nets did not report significant amounts of litter in their fishing gear. On

the whole the fishermen reported that if they encountered litter in their gear, they would remove it and dispose of it into waste disposal facilities on land.

The small sample size of the study could be used to argue that a wider pilot Fishing for Litter study with fishermen is needed locally. Whilst this may be appropriate in localities where fishing methods that are more likely to entrap litter are used (i.e. more akin to the fisheries where other UK Fishing for Litter projects are operating), the majority inshore fisheries around Llŷn use similar types of static gear, and it is reasonable to consider that the responses to the survey give a good indication of the extent of litter entrapment for the inshore Llŷn fishery as a whole. (*The number of respondents represents x% of the local inshore fishermen?*).

The Fishing for Litter project idea is supported by local fishermen in principal but the findings of the study do not indicate that a larger scale Fishing for Litter project around Llŷn along the lines of similar projects elsewhere in the UK is going to be the best use of resources to tackle local marine litter problems. However, it would be beneficial to investigate the applicability of the Fishing for Litter project elsewhere in Wales through similar pilot studies to that undertaken around Llŷn, taking the learning from this feasibility study and applying it elsewhere.

The financial costs for any future Fishing for Litter project need to be further investigated, given large variation in costs reported from other projects litter ranging from less than £500 up to over £50,000.

Portside Facilities

The research demonstrates the importance of a portside free skip, which was used for litter and discarded fishing gear by all fishers. However as all respondents had access to free facilities, it was not possible to determine what fishers without access to this facility would do with their litter and old gear, nor if there are additional disposal costs at other ports. Given the potential for local government budget cuts affecting the provision of some free facilities in the future, further consideration should be given to this issue locally, particularly if existing facilities used by fishermen are no longer going to be provided.

Marine Conservation Society data indicates that fishing related litter is usually higher on Welsh beaches than other parts of the UK. However, as mentioned earlier in the report, it is difficult to ascertain with any certainty how much of this litter is from local fisheries. Also, it is not known whether the fishing related litter is deliberate or due to lost gear as there is no records kept of lost gear. Nor is it possible to determine the country of origin as none of the gear is traceable and much of the fishing-related litter is made up of small pieces of mesh, nets, ropes etc. Some other countries label their pots which can help with traceability of lost gear, but labels can often become detached and indeed tags from North American fishing gear are periodically found on Welsh and other UK beaches, helping to illustrate the global problem of litter.

At the focus group meeting a number of local fishermen expressed interest in finding out more about how fisheries-related litter is recorded and categorised in beach litter surveys.

Survey methodology

This study also demonstrated that local fishermen preferred face to face discussion and interviews and are less keen on undertaking surveys or questionnaires digitally. The Llŷn Marine Ecosystems Project project officer carried out the surveys with fishermen and inputted the responses digitally on their behalf, demonstrating the value of having on the ground officers to take forward this sort of work, These are important considerations in terms of any future Fishing for Litter or other litter pilot projects in Wales.

There was someThe local fishermen were reluctant to provide information on the types of gear used and information such as time in water. This had to be explained as to why this detailed type of information was needed to determine how long gear was in the water before it became entangled or contaminated with litter. This limited survey could not determine this but it will need to be a consideration for future work

Initially, the questionnaire hoped to establish which areas of the study area accumulated the most litter. . It has to be recognised that there may be some reluctance to providing specific information about types of gear used, location and how long gear is left in any one place. This detailed type of information can be helpful to determine how long gear is in the water before becoming entangled or contaminated with litter, and/or any particularly problematic areas. However, as overall no significant issues litter entrapment issues were identified by local fishermen, the study did not identify any specific locations that were considered to be particularly problematic .

Recommendations from the feasibility scoping study:

As a result of the findings of this study the recommendations are separated to those that would best be taken forward locally, and those which would be more appropriately taken forward at an all-Wales or UK level. From the local perspective, the recommendations aim to identify priorities for action to address marine litter around Llŷn and reduce locally-sourced litter that ends up in the marine environment around Llŷn and on local beaches.

Locally-focussed recommendations

- Report sightings. Set up a scheme with fishermen so they are aware of how to, and who to reports sightings of problematic/severe marine litter to.
- Set up agreement between the project and the WFA that the local fishermen bring back to shore any litter that they 'catch'
- MCS to show interested fishers how an MSC survey is conducted and how the litter is categorised
-

Wales/UK focussed recommendations

- Map the location of areas of greatest litter density in Wales to identify where beach cleans and litter monitoring should be focussed

- Consider running a larger survey with a wider range of Welsh fishermen (both commercial and recreational and using both mobile and static gear) to determine the levels of litter interaction and identify where a Fishing for Litter pilot project would best be undertaken in Wales.
- Identify other localities in Wales where there is interest in piloting a Fishing for Litter pilot project, learning from the approach taken with this feasibility study
- Set up a standardised database of evidence to allow for UK wide comparison of results
- MCS to see if it is possible to separate commercial and recreational fishing litter in the MCS litter surveys
- Ensure that the revised Port Reception Facilities (PRF) regulations bring in a 'No special Fee' system Europe wide and extend this to include fishing vessels
- Introduce recycling and disposal facilities for fishing nets and lines at ports and harbours

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Appendix 1

Bag Monitoring Sheet* Number of Bags

For monitoring marine litter brought ashore as part of the Fishing for Litter project

Location: _____ Date: _____

Material	Example item	Total No.
Plastic and Polystyrene		
1	Buoys	
2	Fish boxes	
3	Packaging, plastic sheeting	
4	Rope/cord	
5	Jerry Cans	
6	Nets (including fishing nets and fishing line)	
7	Oil drums	
8	Strapping bands	
22	Fertiliser/Animal Feed bags	
23	Fiberglass	
24	Foam	
25	Bottles	
9	Other large plastic/polystyrene items (<i>please specify below</i>)	
Metal		
10	Oil Drums	
26	Wire	
27	Paint Tins	
28	Oil Filters	

11	Other large metal items (<i>please specify below</i>)	
Wood (Machined)		
12	Crab/lobster pots	
13	Crates	
14	Pallets	
15	Other large wooden items (<i>please specify below</i>)	
Rubber		
16	Gloves	
17	Tyres & Belts	
29	Boots	
18	Other large rubber items (<i>please specify below</i>)	
Textiles		
19	Rope	
20	Clothing & Shoes	
21	Other large cloth/textile items (<i>please specify below</i>)	

Special Observations and Notes (Please note the material number)

Please return to Graham Humphries, Fishing for Litter Co-ordinator:
KIMOUK@aberdeenshire.gov.uk, Fax 01358 723548 or KIMO UK, c/o Aberdeenshire Council,
 47 Bridge Street, Ellon, AB41 9AA
 *Adapted from the OSPAR Pilot Project on Monitoring Marine Beach Litter Monitoring Protocol

ii. Cetacean Entanglement around Llŷn and Mitigation: Evidence Review

Produced by Dr Andrew Woolmer & Harry Owen

1. Introduction

1.1 Cetaceans in the UK and the bycatch issues

The waters surrounding the UK are home to a diverse range of cetacean species, some of which are migratory while others live in resident populations (Reid *et al.* 2003). These populations, like cetaceans worldwide, are under direct threat from a range of anthropogenic forces (Leeney *et al.* 2008). Ship strikes, climate change, habitat destruction, pollution and incidental take (or bycatch) are some of the most immediate threats in British waters (Hammond *et al.* 2013; Harwood, 2001). The paucity of data from other EU countries regarding the effect of these forces on cetaceans makes it impossible to draw conclusions on the overall conservation threat to the region (Northridge *et al.* 2011). On a national scale however the availability of data helped to elucidate the declining health of porpoise populations. Around Cornwall, for example, in the late 1900's porpoise populations crashed (Tregenza, 1994). These declines were linked to organochlorine pollution and decades later levels in blubber samples from bottlenose dolphins (*Tursiops truncatus*) still exceed maximum benchmarks for toxicity (Jepson *et al.* 2005; Crosby *et al.* 2013). However it is now thought that bycatch is one of, if not the most (Read *et al.* 2006), pressing threat to marine mammals worldwide (de Boer *et al.* 2012).

Cetacean bycatch began to feature more heavily in fisheries management (Northridge *et al.* 2011) as concern grew over the hundreds of thousands caught annually across the globe (Read *et al.* 2006). Monitoring this pressure on cetacean populations in the UK really began with fervour in 1995 (Northridge *et al.* 2011) after a large scale cetacean survey (SCANS) was commissioned by the British government (Hammond *et al.* 2013). The survey found that current levels of mortality were, in some areas, unsustainable for harbour porpoise (Hammond *et al.* 2013). These include harbour porpoise in the eastern channel and the disappearance of a small population of bottlenose dolphins from Durlsdon Head in Dorset in 2001 (Hardy & Tregenza, 2010).

There is a growing volume of evidence to support the assertion that bycatch is causing large scale mortality of British cetaceans (Parson *et al.* 2010). This comes from the necropsy and analysis of stranded cetaceans and observer recorded evidence. Cornwall Wildlife Trust, for example, found that as many as 75% of harbour porpoise (*Phocoena phocoena*) examined exhibited signs consistent with gear entanglement (bycatch) and this was the predominant cause of all cetacean strandings (Loveridge & Loveridge, 2007). Further studies found that the level of bycatch had decreased, accounting for 27% of cetacean strandings 2012 (Loveridge & Loveridge, 2012) and 24% in 2013 (Crosby & Clear, 2013). However bycatch was still the main cause of these events in Cornwall in 2013, and the next most significant, disease, caused only 11% (Crosby & Clear, 2013). Elsewhere in the UK similar trends have been observed.

A nationwide study into cetacean strandings between 2005- 2010 found that bycatch was responsible for 24% of all harbour porpoise strandings, the third largest factor after starvation 27%

and dolphin attacks at 25% (Deaville & Jepson, 2011). Common dolphin (*Delphinus delphis*), the species with the next largest quantity of data were stranded due to bycatch in 36% of cases, the single largest factor (Deaville & Jepson, 2011).

Incidental take of marine mammals has become so common that in 1994 the International Whaling Commission stated that it probably occurred in every area where cetaceans and static netting overlap (Hardy & Tregenza, 2010). However the threat posed by fishing is not evenly spread due to differences in fishing gear and the different morphologies and life histories of cetacean species.

The three most common cetacean bycatch species in the UK are harbour porpoise, common dolphin and minke whale (*Balaenoptera acutorostrata*) respectively (Deaville & Jepson, 2011). These species have distinct morphologies, life histories and behaviours and as such have varying levels of vulnerability to different fishing gears. Therefore the type of fishing gear employed will affect the cetaceans most likely to be caught in terms of both species and number.

Harbour porpoise are most often associated with bycatch in gill and tangle nets (Hammond *et al.* 2013; Parsons *et al.* 2010). Observer studies found that in the Celtic Sea alone around 2,200 individuals were killed as a result of gear interaction with the offshore gillnet fishery where nets measuring 1000s of metres are employed (Hammond *et al.* 2013; Crosby *et al.* 2013). Common dolphins are also a frequent bycatch species in gillnet fisheries but also in offshore trawling (Northridge *et al.* 2014; DEFRA, 2003). Age/gender analysis of the carcasses in multiple studies found that females, calves and juveniles are more common in inshore gillnets while there is a predominant bycatch of males in offshore trawl nets (ICES, 2005; de Boer *et al.* 2012).

Minke whales (*Balaenoptera acutorostrata*) and other larger cetaceans are less likely to be caught in trawls and instead they are more often associated with entanglement in static gear buoy lines (Northridge *et al.* 2010). In some areas such as the north-eastern coast of the USA this type of entanglement has led to critical levels of mortality in endangered northern right whale (*Eubalaena glacialis*) populations (Northridge *et al.* 2010). In Scotland post mortem examination of 30 minke whales between 1990-2010 found that mortality in over 50% was due to entanglement (Northridge *et al.* 2010) and in the vast majority of these cases bycatch was directly linked to creel lines (Northridge *et al.* 2010).

The availability of data in the UK has made it possible to identify cetacean bycatch hotspots. These occur where high cetacean populations and areas heavily fished, especially with gears known to have high bycatch overlap. The Cornish coast & Celtic Sea for example is a known hotspot of fishing, cetaceans and cetacean strandings, the single largest cause of which being bycatch (Deaville & Jepson, 2011; Leeney *et al.* 2008; Northridge *et al.* 2014). The Celtic Sea bycatch hotspot relates to the large offshore gill net fisheries taking place beyond 12 nm. The English Channel is a major dolphin bycatch hotspot (Peltier *et al.* 2014; de Boer *et al.* 2012). Here during the winter months, October to March, common dolphins aggregate offshore in areas that overlap with the Bass (*Dicentrarchus labrax*) trawl fishery (de Boer *et al.* 2012). This overlap has seen common dolphin

populations heavily affected by "direct mortality through bycatch" (de Boer *et al.* 2012), with observers documenting 53 dolphins killed in 71 days at sea in 2000 (DEFRA, 2003).

Over the last few decades appreciation of the scale of cetacean bycatch has led to protection being written into both national and international legislation. All cetaceans in the EU are safeguarded under the Habitats Directive and in the UK's waters they are also protected under the 1981 Wildlife and Countryside Act. This however this does not guard them against being killed incidentally (Parsons *et al.* 2010). In 1993 the UK signed the ASCOBANS (Agreement on the conservation of Small Cetaceans of the Baltic and North Seas) treaty and launched the UK Strandings Investigation Program to investigate the cause of these strandings. Increases in reported bycatch showing the expanding scale of mortality (Northridge *et al.* 2014) led to the adoption of EU council regulation 812/2004 (de Boer, *et al.* 2012; Northridge *et al.* 2011). This regulation required that all >12m static net vessels in the Celtic Sea, English Channel and parts of the North Sea use audio deterrent devices (pingers) in an effort to ameliorate cetacean bycatch (Northridge *et al.* 2011).

1.2 Cetacean species in Wales and around the Llŷn Peninsula

A total of 18 cetacean species have been recorded in Welsh seas over the last 3 decades (Baines & Evans, 2012)¹. The five most commonly reported cetaceans in Welsh waters are the harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), Risso's dolphin (*Grampus griseus*) and minke whale (*Balaenoptera acutorostrata*).

The following information about these five species is taken from the Atlas of the Marine Mammals of Wales (Baines and Evans 2012) which presents the findings from a combined data series of cetacean observations spanning 20 years between 1990-2009.

To provide an overall illustration of distribution for each species, the figures for long-term quarterly sightings data from vessel based surveys have been included for each of the five species. Further information about each species is provided in the Marine Mammal Atlas.

Harbour porpoise

The wide distribution of sightings suggests that the harbour porpoise is the most common and widely distributed species around Wales and present all year round in some areas. Harbour porpoise calves occur throughout the region. Harbour porpoise 'hot spots' occur around Wales including:

- North and West Anglesey (around Point Lynas & South Stack, Holyhead),
- the southwest coast of the Llŷn Peninsula,
- southern Cardigan Bay,
- off Strumble Head and Skomer & Ramsey islands, and
- in the Bristol Channel off the Gower Peninsula and in Swansea Bay.

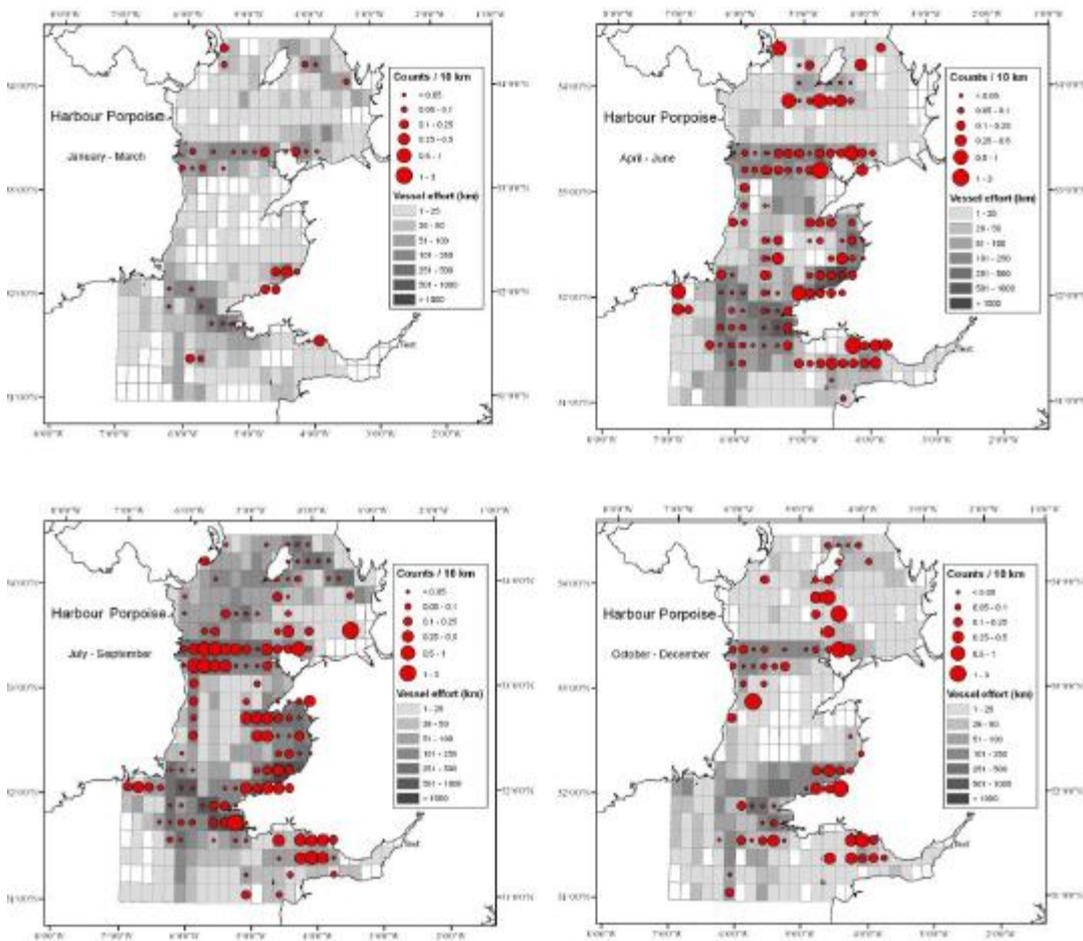


Figure 1. Long-term quarterly mean sightings rates for harbour porpoise in Wales. (Baines & Evans, 2012)

Bottlenose dolphin

The bottlenose dolphin is the second most frequently recorded species in Welsh waters and can be seen at almost any time of the year. They have a predominantly coastal distribution, although low densities have been recorded offshore. The main concentrations of sightings have been in southern Cardigan Bay but with moderately high sightings in Tremadog Bay and sightings off the north coast of Wales, particularly north and east of Anglesey. In summer, mainly small groups occur near the coast, centred upon Cardigan Bay whereas in winter the dolphins are dispersed more widely and generally northwards, and may form very large groups. Bottlenose dolphins breed throughout their Welsh range, with calves observed in most months of the year.

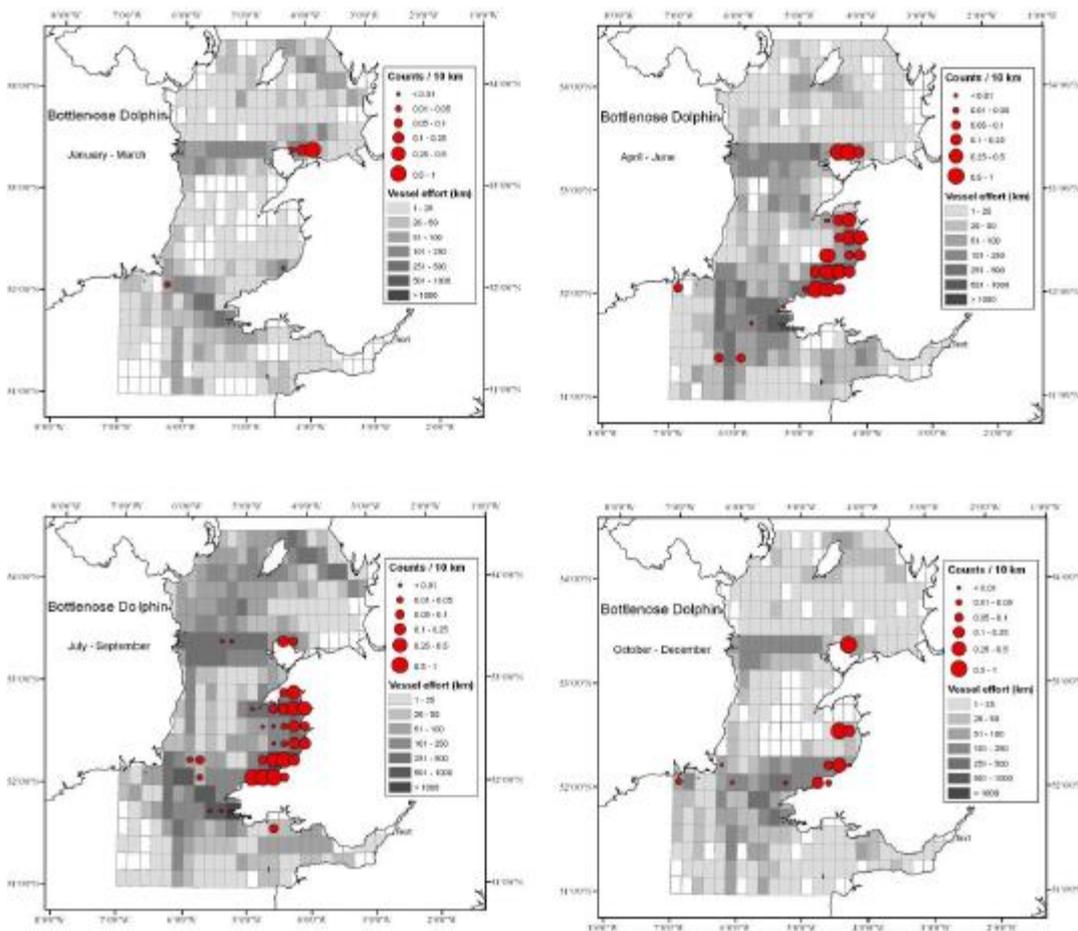


Figure 2. Long-term quarterly mean sightings rates for bottlenose dolphin in Wales. (Baines & Evans, 2012)

Short-beaked common dolphin

The short-beaked common dolphin has a largely offshore distribution centred upon the Celtic Deep at the southern end of the Irish Sea including the coast and islands of west Pembrokeshire. Elsewhere in the Irish Sea, this species occurs at low densities mainly offshore, in a central band that extends northwards towards the Isle of Man. It is mainly a summer visitor although persisting in the Celtic Deep at least to November. Similar patterns of distribution are seen throughout the year. An influx of juvenile groups may occur in late summer. Most

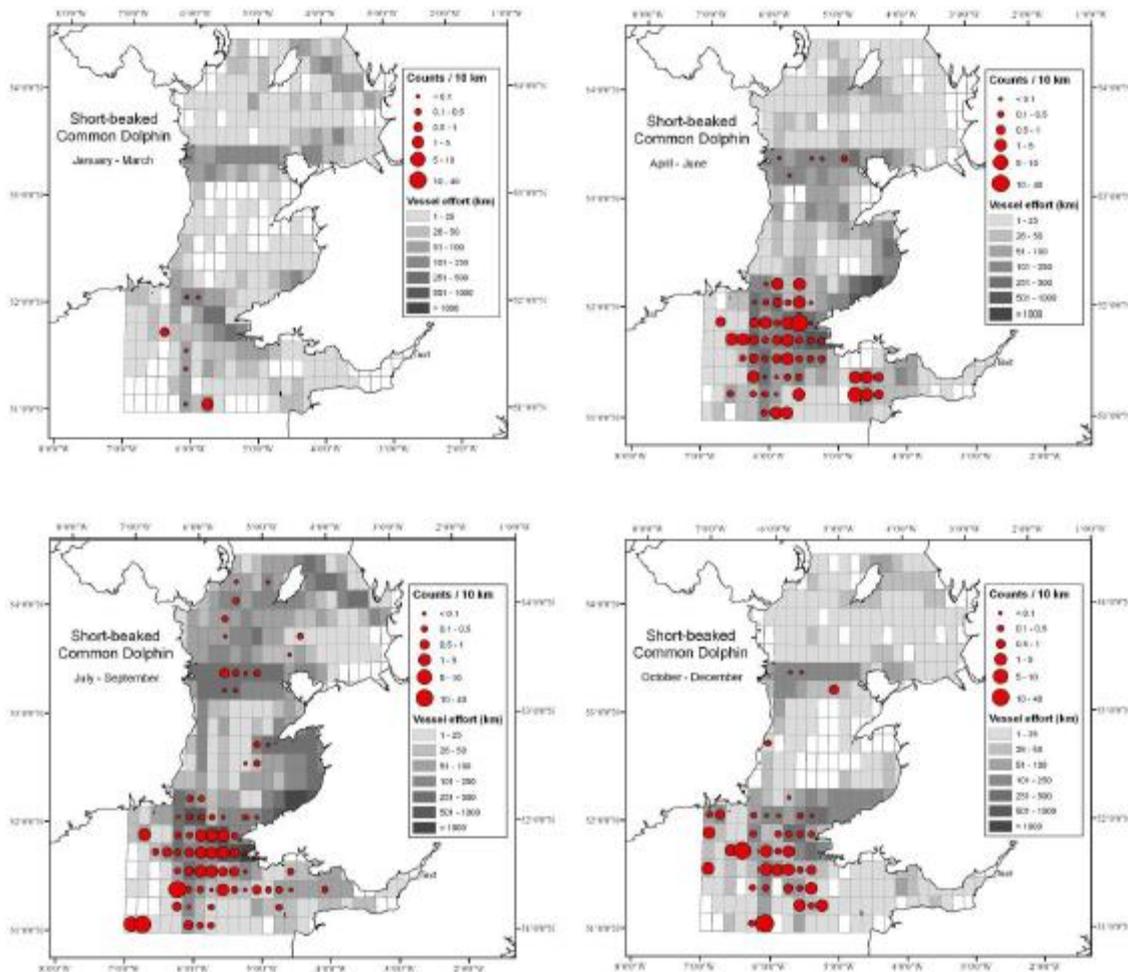


Figure 3. Long-term quarterly mean sightings rates for short-beaked common dolphin in Wales. (Baines & Evans, 2012)

Risso's dolphin

Risso's dolphins have a relatively localised distribution, forming a wide band running SW-NE that encompasses west Pembrokeshire, the western end of the Llyn Peninsula and Anglesey in Wales, the south-east coast of Ireland in the west, and waters around the Isle of Man in the north. This general distribution appears to have persisted over the long-term although numbers visiting the coasts of Wales can vary a great deal between years. The species is mainly a summer and autumn visitor, with the highest sighting rates in the period July to September. Risso's dolphins breed in the region, and young have been observed wherever groups have been sighted.

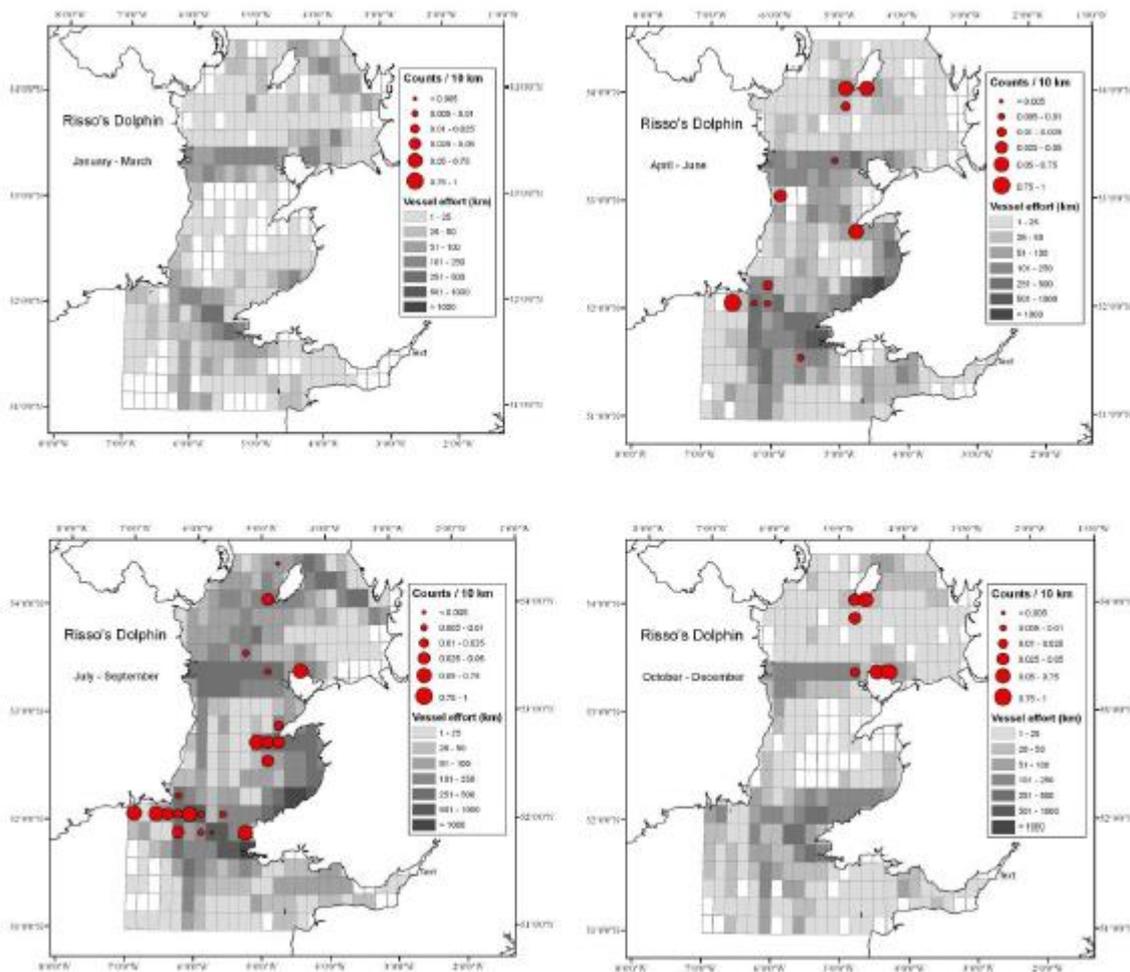


Figure 4. Long-term quarterly mean sightings rates for Risso's dolphin in Wales. (Baines & Evans, 2012)

Minke whale

The minke whale has a largely offshore distribution, with highest densities of sightings occurring in the area of the Celtic Deep, although the species is found also in deeper areas (generally >50 m) northwards particularly between the coast of Co. Dublin and Anglesey, and around the Isle of Man. The species appears to be a mainly summer visitor to the region, with few sightings in winter, although this may partly be due to low sightings effort at that period. There is no evidence as yet that the species breeds in Welsh waters.

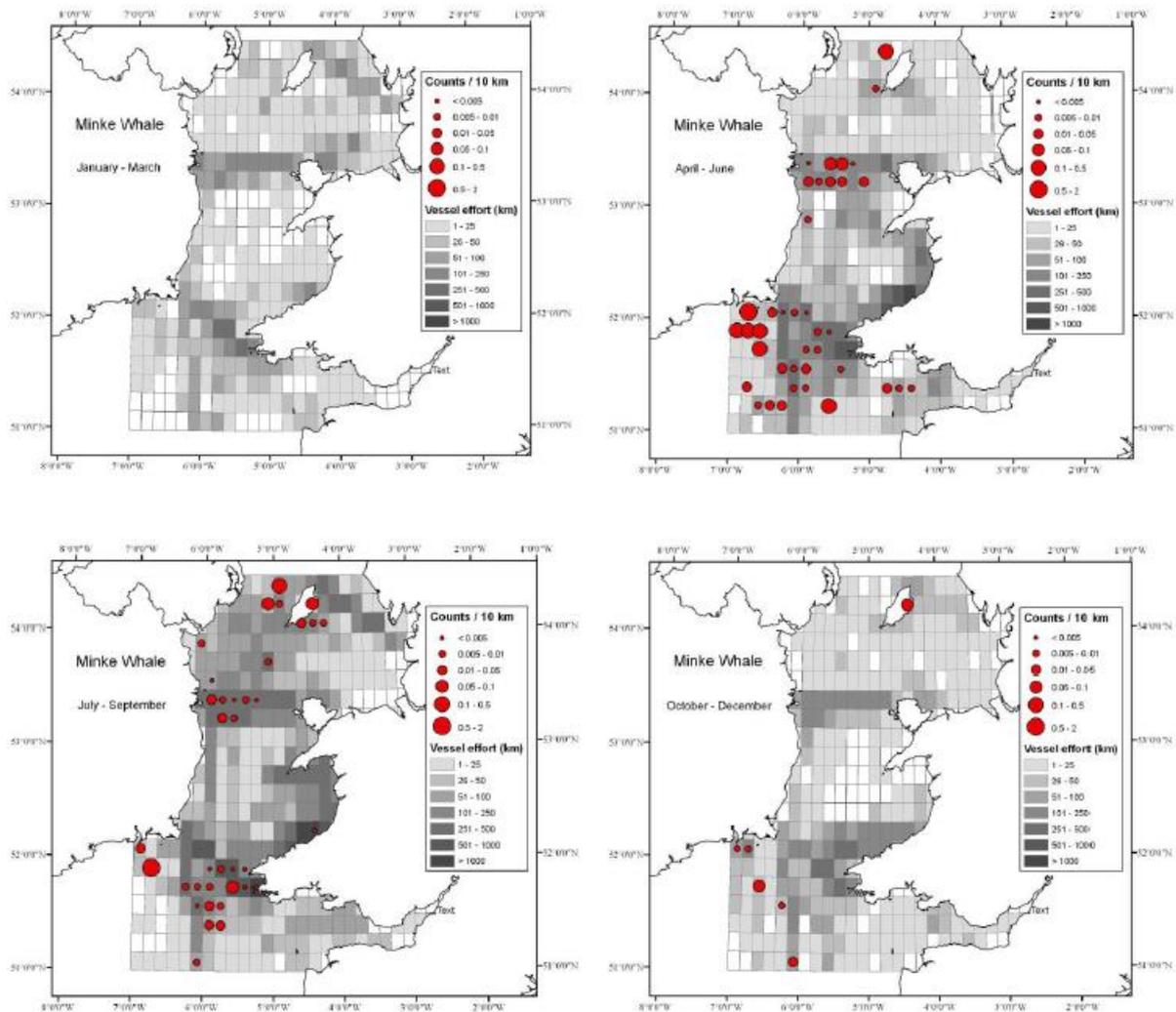


Figure 5. Long-term quarterly mean sightings rates for minke whale in Wales. (Baines & Evans, 2012)

The most recent Article 17 reports on protected cetacean species that may occur around Llŷn assesses that they are at a Favourable Conservation Status at a UK level³. At this time NRW do not produce site (SAC) or country level assessments of Favourable Conservation Status, however we are aware that these are currently in development.

Management of cetacean species in the UK is undertaken at Management Unit (MU) level. In Wales this is at the scale of the Celtic and Irish Seas Management Unit, and therefore NRW has to consider bycatch in the wider area, especially in the SW Approaches where bycatch is considerable. Presumably this wider consideration will influence official view on the status of harbour porpoises and other cetaceans in Welsh waters and the Management Unit.

The most recent information on cetacean strandings around Wales reports that 114 dead or live stranded cetaceans were recorded around Wales in 2014 (Penrose, 2015). Of these Harbour porpoise was the most frequently recorded species with 89 individuals stranded.

Of the 114 strandings recorded in 2014 twenty two were selected for *post-mortem* examination by the Zoological Society of London (ZSL). Bycatch was determined as cause of death in 4 cases all of which were harbour porpoise.

A total of 13 strandings were reported around the Llŷn project area in 2014 (*Table 1*)

Table 1. 2014 strandings around the Llŷn (after Penrose, 2014)

Family/Genus	Sex	Length	Condition	Locality	Grid
Short-beaked common dolphin	U		moderate decomposition (code 3)	Hells Mouth	SH 290 257
Bottlenose dolphin	M	3.34	slight decomposition (code 2b)	Hell's Mouth	SH 281 265
Short-beaked common dolphin	U	-9	moderate decomposition (code 3)	Abersoch	SH 316 286
Harbour porpoise	U	-9	live-died	Abersoch	SH 316 286
Harbour porpoise	U	-9	alive- refloated (code 1)	Black Rock Sands	SH 530 370
Bottlenose dolphin	M	130	moderate decomposition (code 3)	Pwllheli	SH 348 332
Harbour porpoise	U	-9	moderate decomposition (code 3)	Pwllheli	SH 384 342
Harbour porpoise		-9	slight decomposition (code 2b)	Black Rock Sands	SH 530 370
Harbour porpoise	U	-9	moderate decomposition (code 3)	Porth Neigwl	SH 275 269
Harbour porpoise	F	100	moderate decomposition (code 3)	Pwllheli	SH 380 342
Harbour porpoise	F	121	advanced decomposition (code 4)	Hell's Mouth	SH 283 263

³ http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1351_UK.pdf

Family/Genus	Sex	Length	Condition	Locality	Grid
Short-beaked common dolphin	U	-9	advanced decomposition (code 4)	Hell's Mouth	SH 260 280
Harbour porpoise	U	-9	moderate decomposition (code 3)	Pwllheli	SH 384 350

The location that a stranded (dead) individual is reported is not an accurate representation of where that individual originally died as the carcass may have travelled some distance before being washed up on a beach. However, the condition categorisation employed by cetacean researchers described by Kuiken & Hartmann (1991) does provide a means of filtering out those individuals which have been long dead and those that have died more recently (*Table 2*). Given the multiple factors that can influence where a dead cetacean strands and its condition when recorded, the best that can be inferred from the condition index is that freshly stranded dead animals may, **depending on conditions, indicate the animal was from local/regional area.**

Table 2. Strandings condition codes (see Kuiken & Garcia-Hartmann, 1991)

Condition Code	Description
1	Live animal
2a	Extremely fresh as if just died
2b	Slight decomposition
3	Moderate decomposition
4	Advanced decomposition
5	Mummified carcass

2.2 Fishermen's knowledge of bycatch

In order to understand the operational experience of bycatch in the fishing industry around Llŷn a meeting was held with local fishermen in October 2015 followed by a series of one-on-one interviews during October-December 2015 carried out by the Llŷn Ecosystems Project Officer Catrin Glyn. These semi-structured interviews were designed to allow fishermen to offer their views and experiences of bycatch and entanglement without risk of censure.

The interviews, although semi-structured, were wide ranging with a variety of fishing and conservation related subjects discussed. Often these focused on common themes that are affecting the industry. Although outside the scope of this evidence study the interview notes were very informative and demonstrated the shared understanding of the participants of key issues and also some commonly held views of solutions. This approach is worth pursuing in the development of solutions to management issues and for on-the-ground sense checking of risks and new issues promoted on a national level.

The consensus of the fishermen involved in Llŷn fisheries was that bycatch of cetaceans did not occur or if it did they were not aware of it. None interviewed had any personal experience of

cetacean entanglement or bycatch and many stated that they had never heard of an incident (Table 3). Although these statements may be viewed with scepticism from some quarters, the views provided on a variety of issues in the interviews were voiced in a spirit of openness and were quite frank and informative. The authors believe that the observations that cetacean bycatch and entanglement being rare around Llŷn should be taken at face value.

Table 3. Outcomes of fishermen's interviews

Area/Port	Experience of bycatch / entanglement	Quotes
Abersoch	No experience	<i>I've never had any experience with bycatch nor have I ever heard of anyone else having a problem for that matter. I've never ever heard of anyone catching or finding a dolphin or porpoise in the nets in the area. We fish in one of the hotspots for dolphins and porpoises here in Llŷn, so if we've never had an issue, I doubt any one else has</i>
North Llŷn 1	No experience	<i>I gill net and have never caught a dolphin, porpoise or seal / I am seeing more and more dolphins and porpoise in the area</i>
North Llŷn 2	No experience	<i>I've seen dolphins and porpoises between Pwllheli and Abersoch, but never from Tudweiliog / I've never heard of anyone catching one, or a dolphin or porpoise for that matter.</i>
Porth Neigwl - Rhiw	No experience	<i>Plain and simple, 35 years of netting, never caught any cetacean, and no one else either that I know</i>
Pwllheli	No experience	<i>I've never caught a dolphin, porpoise or seal. But I have caught one or two Carpet Sharks</i>
Porth Colmon	No experience	<i>I have never caught a seal, dolphin or porpoise in the net.</i>
Porthdinllaen	No experience	<i>We never experienced any problems with bycatch, but I've heard of turtles getting caught. I've heard about two occasions near Tudweiliog / • In my opinion, netting happens on a very low scale in Llŷn so there isn't enough netting activity or evidence of bycatch to have to do something about it</i>

2.3. NRW assessment of bycatch and entanglement in Wales/Llŷn

NRW are not aware of any bycatch of marine mammals occurring within Pen Llŷn a'r Sarnau or any Welsh SACs, and there is limited evidence of bycatch of cetaceans and seals in Welsh waters. The majority of bycatch of marine mammals in the UK is through using bottom set nets (e.g. Gill nets) and tends to occur around in UK offshore waters around the Southwest approaches.

3. Bycatch Toolkit: options for mitigation

Whilst the current view is that bycatch of cetaceans is not a specific issue within the local Llŷn area, should cetacean entanglement and bycatch be identified as a problem for this area in the future, there are a number of practical approaches available to address and mitigate these risks. This section of the report sets out possible approaches and methods that could be considered in order to address cetacean bycatch risks if this is identified as a problem in the future. It is not the intention of the author to make specific recommendations but rather to explain what options could be applied and adapted to local conditions as required.

There are three principal mitigation approaches for bycatch avoidance; spatiotemporal restrictions, modification of fishing methods or behaviours and, technical measures in the form of acoustic deterrents (pingers). This section outlines some options for mitigation that can be drawn upon by Llŷn Marine Ecosystems Project stakeholders in their development of locally appropriate actions.

It is important to bear in mind when discussing and developing new management or mitigation options that they should be both proportionate to the level of risk, and reasonable, having taken the relevant evidence into account.

3.1 Temporospatial measures

Temporospatial measures are actions designed to focus on a specific location (-spatial) over a period of time (temporo-). The actual actions can range from simple changes in behaviour to strict restrictions on activity, whatever is necessary and reasonable.

Temporospatial closures are a fisheries management tool that is commonly used, including in Wales, to protect commercial species at certain times of the year at certain locations e.g. spawning grounds or nursery areas. Similar restrictions are used to manage or restrict fishing effort on target species, a good local example is the Cardigan Bay scallop box which is only open between November and March and has a well-defined spatial boundaries.

The temporospatial approach is less commonly employed to protect sensitive site features as these are very often seabed habitats which do not have a variable sensitivity over the year. This approach is more often applied to mobile species that are sensitive to an activity at a particular time of year such as overwintering or nesting seabirds.

3.1.1 Example: Poole Harbour seasonal zonation, Southern IFCA

A good example is the Poole Harbour clam fishery that takes place in a highly protected SAC and SPA for birds. This is a seasonal fishery that operates between 25th May to 24th December to accommodate the overwintering wader and wildfowl but has additional areas within the harbour that are closed at certain times of the year when the birds are particularly sensitive (*Figure 2*).

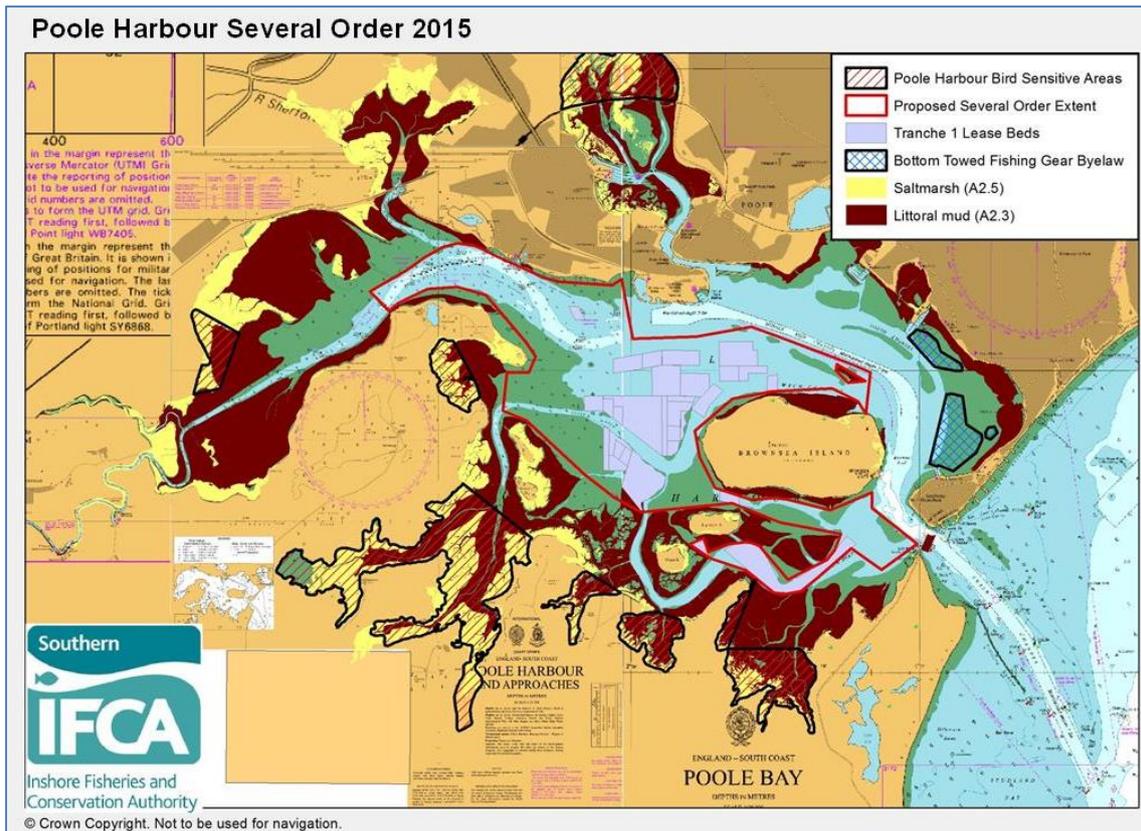


Figure 2. Example of temporospatial closures in Poole Harbour

3.1.2 Example: Real-time Cod closures Scotland

The real-time fishing closures operated in Scotland may offer a model for a flexible approach to temporospatial measures to mitigate bycatch and entanglement risks. Scotland has implemented a system of “real time” closures of sea areas where there are concentrations of cod, such as at spawning time or where there are large aggregations of juveniles since 2007. The areas are relatively large measuring 15 x 15 nm and 7.5 x 7.5 nm but are sited beyond 12 nm. These closures are designed to help the continuing recovery of cod stocks. Real-time closures are triggered when fishing vessels landings data or boarding samples show the presence of cod above a trigger CPUE.

3.1.3 Example: Dynamic Area Management of static gears East Coast, USA

The Atlantic Large Whale Take Reduction Plan is a mitigation strategy developed to reduce inadvertent whale entanglement in Maine (US)⁴. The Dynamic Area Management (DAM) program outlines a system of real-time area closures implemented to protect unexpected aggregations of right whales that met an appropriate trigger by temporarily restricting lobster trap/pot and anchored gillnet fishing in a designated areas. These closures are triggered when aggregations of threatened right whales (*Eubalaena glacialis*) are reported at a location or within an area of ocean.

Once a DAM zone is identified, the fishery managers (NOAA) may:

- 1) require the removal of all lobster trap/pot and anchored gillnet fishing gear for a 15-day period;

⁴ <http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/>

- 2) allow modified lobster trap/pot and anchored gillnet gear within a DAM zone for a 15-day period; and/or
- 3) issue an alert to fishermen requesting the voluntary removal of all lobster trap/pot and anchored gillnet gear for a 15-day period, and asking fishermen not to set any additional gear in the DAM zone during the 15-day period.

Subsequent to the introduction of the DAM program, gear modifications have been developed designed to reduce the risk of entanglement to right whales and, therefore acceptable for fishing in DAM zones were implemented. This combined approach enables fishing to continue in high cetacean use areas but addresses the main risks associated with them.

3.1.4 Approaches for Llŷn

In the context of small cetacean (dolphin and porpoise) where bycatch risk is more common around the UK, the flexible approach of temporary zones could be a useful tool; information on high numbers of cetacean species observed at any location could be shared with local fishermen in order that they could avoid setting nets for a short period. Clearly this would need to be subject to a local agreement with the fishermen to ensure that they all upheld the arrangement.

3.1.4.1 Key features of temporospatial measures

In the context of cetacean bycatch and entanglement, temporospatial restrictions may be appropriate when,

1. there is a well-defined location and spatial area of high cetacean activity at a well-defined time of year and,
2. netting activity regularly occurs in the same area during the same time of year and there is considered to be a risk or,
3. there is evidence of previous entanglements or bycatch in that area.

Temporospatial restrictions may include,

- areas of any size from small to large,
- periods from the short-term to permanent.

3.2 Modification of fishing behaviour or methods

3.2.1 Modification of fishing behaviour

Perhaps some of the most effective and straightforward approaches to mitigating the risk of entanglement or bycatch are modification of behaviours. Similar types of action have already been developed in the Llŷn Marine Ecosystems Project to avoid disturbance to cetaceans:

Dolphins, Porpoises & Seals

If these creatures are encountered at sea please:

- **Slow down** gradually to minimum speed. Do not make sudden changes in speed or course.
- **Do not** steer directly towards them or approach within 100m.
- **Do not** attempt to touch, feed or swim with them.
- **Take extra care** to avoid disturbing animals with young.
- **Do not** approach seals resting on the shore, and do not enter sea caves during the pupping season (1st August to 31st October).
- **Do not** discard litter or fishing tackle at sea.
- **Avoid** making any unnecessary noise near the animals.

3.2.1.1 Example: St Ives netting Code of Practice, Cornwall IFCA

An example of how simple changes in practices can address bycatch issues comes from Cornwall. Cornwall IFCA developed with local fishermen and other stakeholders a local Code of Practice for the use of fishing nets in and adjacent to St Ives Bay in response to a local seabird bycatch issue where feeding diving birds were becoming entangled in nets in 2012. The Code of Practice outlines a series of practical and common sense actions for fishermen to take to modify their fishing patterns to account for the seabird behaviour⁵ (over page).

Although some of the actions such as the night time only netting restriction are not applicable to cetaceans, the simple avoidance and reporting ones are good examples of where straight forward actions could have a tangible outcome. This Code of Practice was developed with local fishermen and reflected what actions would work with their fishery and fishing patterns, at another site with different fisheries and fishing patterns these actions may not be appropriate.

⁵ https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Code_of_practice/St_Ives_Area_Nets_Code_of_.pdf

The Code of Practice has subsequently been strengthened by the development of a Bylaw that allows the IFCA to put in place a temporary ban on gill nets in an area of the Bay, much like the DAMs described above.

Fishing nets used in & adjacent to St. Ives bay Code of Practice

To avoid significant numbers of sea bird deaths through their accidental capture in fishing nets, the points listed below should be followed by any fisherman using nets in and adjacent to St. Ives Bay:

- If seabirds are seen gathering to prey on fish in any area where you want to use nets, only shoot and haul them in the dark when birds are not diving below the surface of the sea;
- If there is a significant chance that weather conditions may prevent retrieval of nets before daylight in an area where birds are feeding, do not shoot nets there;
- If you shoot a net in the dark to avoid sea birds and find that you cannot haul it before daylight, ask for assistance from other fishermen who may be in a position to help. If nets cannot be hauled before daylight, contact the Cornwall IFCA (01736 336842) to report the situation. Cornwall IFCA may be able to assist with net recovery.
- If you do accidentally catch birds in your nets, ensure that other net fishermen in the area, officers of the Cornwall IFCA and harbour masters at St Ives and Hayle are informed as soon as possible;
- If you are informed of an area where accidental capture of sea birds in nets has just occurred, any nets you may have there during daylight must be hauled as soon as possible. No nets are to be used in the affected area during daylight until sea birds have moved away;
- If sea birds are feeding in an area where net fishing is required during daylight hours, net fishermen are to discuss with each other and consider a voluntary ban on netting during the day in the affected area. Any decision to act together on a voluntary basis will be assessed daily to ensure that it is or remains effective.

3.2.1.2 Avoidance and herding, offshore industries

Avoidance is an approach adopted as a key part of the approach taken by the offshore industries in mitigating potential impacts to cetaceans during seismic surveys. In the offshore oil and gas industries it is the creation of sound, using an airgun in seismic surveys, which has the potential to seriously harm cetaceans (Wright & Cosentino, 2015). To mitigate potential harm the industry must follow set guidelines before and during any such surveys (JNCC, 2010). These guidelines laid down by the JNCC were the first of their kind and responded to the understanding that seismic surveys have the potential to cause real damage to local cetaceans (Wright & Cosentino 2015). Before the

airgun (that creates the seismic waves) is fired there must be a 30 minute to 1 hour search to make sure no cetaceans are within a 500m radius (JNCC, 2010). The search is undertaken by both visual search by trained spotters and by acoustic search using hydrophones. Provided no cetaceans are detected in the search or via passive acoustic monitoring (for cetacean vocalisation) a soft start will then be initiated (JNCC, 2010). If cetaceans are detected then operations are either delayed or relocated to another site i.e. avoidance.

If no cetaceans are detected a 'soft start' will then commence (JNCC, 2010). During this time, the power of the airgun is steadily increased over 20 minutes to allow undetected cetaceans a chance to leave the vicinity (JNCC, 2010). The 'soft start' method works to herd any undetected cetaceans out of the area. Clearly there is no soft start approach that is applicable to fishing operations and even if it was it is unlikely that it would be permitted for regular use. The principle of carrying out a visual search before operations is however an approach that may be effective in fishing operations.

3.2.2. Alternative fishing practices

In the event that there is evidence that bycatch or entanglement is associated with a particular fishing method there may be scope for fishermen to consider alternative fishing methods which carry less risk. In practice this may be an unreasonable burden but in some instances may enable fishing to continue when the alternative are more prohibitive restrictions such as area closures.

Probably the only real alternative to static boat-set nets are long-lines but these are a wholly different method of fishing which, although very successful in some fisheries, may not be appropriate in the fisheries around Llŷn and would need to be assessed for other cetacean risks. This could be a discussion topic for future meetings or workshops should areas of high risk be identified.

3.2.3 Approaches for Llŷn

In the context of any cetacean bycatch or entanglement issues around Llŷn there may be some quite simple actions that can be taken to avoid the risks. Local fishermen are probably the best placed to judge which actions will work with their fishery especially changes in fishing method but it is likely that simple avoidance is the most readily applied action. This could simply be avoiding shooting nets at locations where cetaceans are observed feeding or aggregating.

3.3 Technical measures

3.3.1 Gear modification

Gear modification has been successfully employed as a mitigation measure to reduce small cetacean bycatch in both pelagic mobile gear, and static potting and net fisheries.

3.3.1.1 Example: Mobile gear separator grids

The mobile gear sector has developed a series of gear modifications to reduce and mitigate small cetacean bycatch. These modifications usually take the form of separator grids or panels that direct

any small cetacean entering a trawl out of an escape panel in the top of the net. This approach has been tested in the offshore bass pair trawl fishery which has been affected by cetacean bycatch⁶. Similar Selector Grids are used in nephrops fisheries to reduce the discard level of non-target finfish (Figure 3)

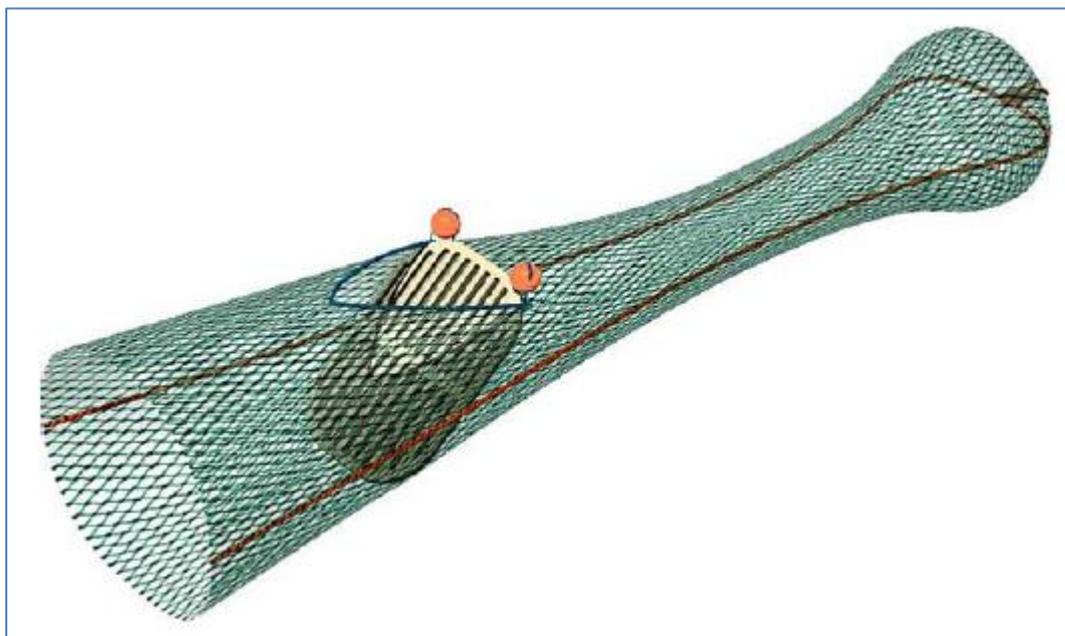


Figure 3. Nephrops cod-end with selector grid fitted. From Catchpole & Revill, 2007

3.3.2.1 Example: Static gear weak links

Gear modification to reduce cetacean entanglement in static gear fisheries is more challenging but has been achieved for large cetaceans where issues occur. The introduction of weak links on anchors and a key positions on the gears has been demonstrate to successfully reduce the risk of entanglement and should it occur, reduce the risk of mortality in whales until an intervention can be undertaken. These are outlined in the Atlantic Large Whale Take Reduction Plan Regulations in the US. In areas where fishing occurs and where whales either are seasonally in residence or are encountered on migration both static nets and lobster pots are required to be fitted with weak links (Figure 5)

⁶ http://www.eurocbc.org/MF0733_CSG15_SMRU.doc

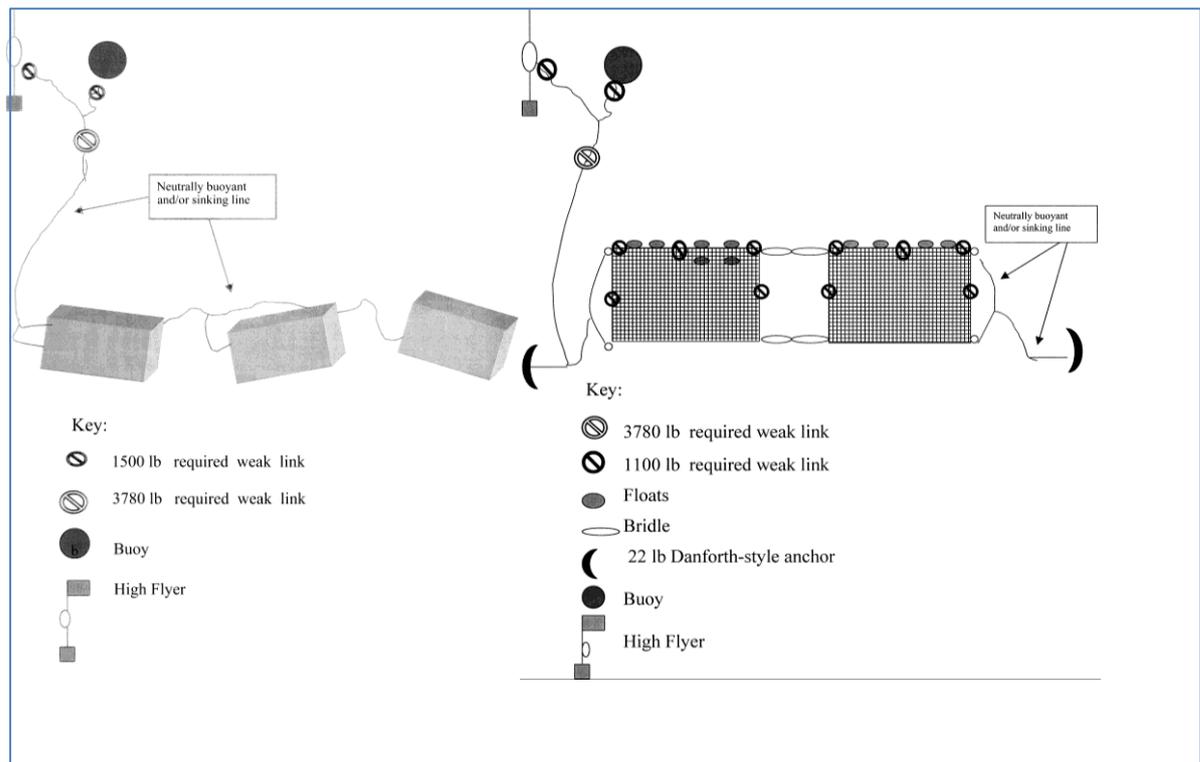


Figure 4. Schematic of weak links required by Atlantic Large Whale Take Reduction Plan Regulations

3.3.2 Acoustic deterrents (pingers)

Pingers are audio deterrent devices that act to reduce bycatch by alerting cetaceans to the presence of a net or by driving the animal away from the area (Crosby *et al.* 2013). They can be placed on either static nets or trawls and have been largely successful at reducing entanglement since their statutory introduction in 2004 (EC, 2004). However, complications surrounding the implementation of EU council regulation 812/2004 has meant that uptake has not been swift (Northridge *et al.* 2014; Hardy & Tregenza, 2010). Nevertheless where pingers have been used there has been a high degree of success (Hardy & Tregenza, 2010; Northridge *et al.* 2011).

The Sea Mammal Research Unit (SMRU) conducted a trial with pingers on offshore gill and trammel nets in the western Channel and the Celtic Sea. Results of the multiyear trial showed statistically significant declines in the number of porpoises caught when pingers were in operation, and for nets of <4km bycatch fell by around 95% (Northridge *et al.* 2011). Similar results have been observed in inshore trials in Cornwall where cetacean acoustic activity was measured when pingers were in use and compared to periods with no pinger activity. Results showed an acutely negative relationship between porpoise activity and pinger use (Hardy & Tregenza, 2010). This should equate to a reduction in cetacean bycatch of around 80% (Hardy & Tregenza, 2010).

Fewer studies have been carried out to assess the effectiveness of pingers on trawl nets. However as of 2006 they have been tested by the midwinter Channel bass trawl fishery (Northridge *et al.* 2011). Between 2004-2006, before pinger application, dolphin bycatch rates were greater than 1 per tow on average (Northridge *et al.* 2011). After the introduction of pingers in 2006 bycatch

dropped to around 0.15 per tow (Northridge *et al.* 2011), clear evidence that pinger use reduces dolphin mortality in this fishery.

While reductions in cetacean bycatch with pinger use are clear there are some concerns surrounding their widespread use. Initial concerns focused on the high start-up cost, short battery life leading to operational difficulties (Crosby *et al.* 2014) and potential safety issues (Caslake and Lart, 2006). Today, these issues have largely been addressed with new designs and technology, and the remaining concerns over the effect pingers could have on driving cetaceans from their foraging grounds is a priority. Studies have shown a marked complete reduction of cetacean acoustic activity around active pingers used offshore of between 0.4-3km, depending of the model (Hardy & Tregenza, 2010; Northridge *et al.* 2011). Northridge *et al.* (2011) argue that this would result, in times of high fishing activity, that cetaceans could be excluded from up to 11% of the Celtic Sea and western Channel. This could have serious implications for their foraging success. This has led many to question a one size fits all policy for pingers and suggestions that the policy should instead target fisheries and areas where the risk of bycatch is unacceptably high (Hardy & Tregenza, 2010; Northridge *et al.* 2011). This could include for example wreck fishing in the North Sea that is known to have unexpectedly high cetacean bycatch (Northridge *et al.* 2011).

The Welsh Fishermen's Association recently trialled a small pinger suitable for use in the inshore fisheries (Woolmer, 2015). This trial set out to understand the operational use of the Fishtek Banana pingers on typical fishing gears used in Wales. This work followed a detailed field trial in 2013 of the Fishtek Banana Pinger which carried out in a collaborative research study involving fishermen and Cornwall Wildlife Trust⁷. This study assessed whether a newly available cost-effective design of acoustic deterrent, the Banana Pinger, would be effective and practical for use on smaller vessels (Figure 5).



Figure 5. Fishtek Banana Pinger fitted to the footrope of a static net

Using acoustic monitoring the trial showed that the detection rate of porpoises in the vicinity of nets fitted with pingers was reduced by 82%. This reduction is considered to indicate a large

⁷ http://www.ascobans.org/sites/default/files/document/NSG4_Inf_4.3_BananaPinger.pdf

reduction in risk of entanglement for porpoises and exceeds previously reported results for other commonly used pinger designs.

The trial also investigated behavioural effects of the pinger on porpoise and dolphins, such as long-term displacement, habituation, or attraction (the 'dinner bell' effect). There was no decrease in pinger effect over the 8 month period of the trial, indicating that habituation was not likely to be an issue. In addition there was no form of attraction of any of the cetacean species studied to the pingers and the deterrent effect was maintained throughout the trial.

With a unit cost of around £40 with a single battery lasting a year in normal usage, it is likely that should there be a need for acoustic deterrents around Llŷn then these Banana pingers would be suitable.

3.3.3 Approaches for Llŷn

Gear modifications such as the weak links employed to mitigate large cetacean entanglement are likely not appropriate mitigation approaches for fisheries in operation around Llŷn as the most common cetaceans in the area are small porpoises and dolphin species. It may be possible to develop small cetacean specific modifications if entanglement can be associated with a particular part of the gear but in the case of static nets this may be difficult.

The use of pingers and particularly small pingers like the FishTek Banana pinger are likely to be the most appropriate technical approach for mitigating any bycatch or entanglement risk for the static gear fisheries around Llŷn.

The most practical approach would be to deploy these in areas of highest risk than a blanket approach around the whole coast.

Conclusions and future directions

The Llŷn EBA project was established to investigate and develop best practice and management to inform wider management of the marine environment around Wales. This small study serves to demonstrate the project ethos in microcosm; it is a good example of how the Llŷn EBA project stakeholders have identified a possible issue, reviewed the available evidence, drawn upon local ecological knowledge and identified possible management actions to address potential risks. The current study is a good example of how local-scale co-management can review, assess and address local conservation and fisheries issues.

The review of evidence in this study highlighted the vulnerability of small cetaceans to entanglement and becoming bycatch in both midwater trawls and static nets. The levels of cetacean bycatch and incidence of entanglement around the UK and in Wales does not appear to be equal with higher risks being associated with particular fisheries, namely the offshore netting and pelagic trawls. This has previously been identified and addressed by EU regulations (EU council regulation 812/2004) and associated mitigation measures such as pingers.

The situation around Llŷn appears to be somewhat less serious. Discussions with fishermen during meetings and in one-on-one interviews suggest that bycatch and entanglement is likely to be a very rare occurrence with no fisherman experiencing such an event.

The discussions with fishermen and examination of fishing methods employed around Llŷn suggest that although netting does occur, it does not occur in high intensities or as a year round activity. Unlike the offshore netting in the Celtic Sea where issues certain do exist the netting around Llŷn may present a comparatively minor risk.

Based upon the evidence reviewed and the statements of the fishermen who work the waters around Llŷn, it is concluded that there is a low risk of entanglement or bycatch of cetaceans in the project area at this time.

Should fishing methods or patterns, or cetacean species behaviour or distributions change significantly this assessment will have to be revised. Should a higher risk of entanglement or bycatch be identified then the project stakeholders can draw upon the mitigation methods discussed in this study to develop practical and locally relevant management.

Addressing information gaps to enable adaptive management

specific evidence on bycatch levels in Wales is lacking. Addressing this knowledge gap is difficult but further work could be undertaken to improve the existing information gaps. Of the 114 strandings recorded in 2014 a number only 22 were necropsied to establish cause of death (presumably due to resource constraints as such activities are costly and logistically problematical with storage of carcasses and transport having to be arranged and carried out). There may be scope to develop reporting by the fishing industry, possibly an anonymised approach to avoid disincentivising participation. This is a sensitive subject and something that will need to be discussed by the EBA project participants to consider whether it is worth pursuing.

The reduction in Government funding for all departments and statutory agencies may lead to reduced funding for monitoring and assessment work. This may further affect the data gathering on cetacean species numbers and conservation status. It is in the interest of all stakeholders, including fishermen, that sufficient data gathering is undertaken in order that future assessments are evidence based and that overly precautionary management is avoided. There may be scope within the EBA project to develop partnership approaches to gather data on cetacean numbers and distributions around Llŷn to inform adaptive management.

Information on fishing activity such as activity type and location at which it occurs is a well-recognised information gap in marine management. Such information would have been useful in this study to identify any hotspots of activity that could be higher entanglement risk areas. Whilst not vital in the context of this study given our assessment of a low risk to cetacean species, such information would be useful across the spectrum of fisheries management around Llŷn. Routine collection of this type of activity would inform adaptive management and identify changes in fishery practices.

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iii. Gwynedd's Marine Code – Design and Consultation

Marine Ecosystems Project

Gwynedd's Marine Code – Design and Consultation

September 2015



Partneriaeth Tirlun Llŷn Landscape Partnership

Cymdeithas Pysgotwyr Llŷn Fishermen's Association

Funding:

The Llŷn Marine Ecosystems Project was integrated into the Welsh Government Nature Fund work to encompass all elements of the local environment around Llŷn. The Nature Fund offered a great opportunity to bridge the gap between terrestrial and marine implementations in Llŷn. This enabled the Pen Llŷn a'r Sarnau SAC and the Llŷn Landscape Partnership to work alongside each other on the bid and secure funding to appoint a Project Officer, together with funding by SeaFish.



Content

Marine Ecosystems

Project Why update the

code? Ceredigion's

Code A new draft for

Gwynedd Consultation

Final Draft

Marine Ecosystems Project



This is a pilot project located in Pen Llŷn and is an evolution of the work of the Pen Llŷn a'r Sarnau Special Area of Conservation (SAC). The project is a result of a document formulated by the Welsh Fishermen's Association which proposed a method of managing the sea that would improve our understanding of the marine environment and promote the recovery and resilience of ecosystems without having a detrimental impact on local fishermen and communities. A method that would safeguard cultural and economic life and protect traditional fisheries and recreational activities. Therefore, the Pen Llŷn a'r Sarnau Special Area of Conservation and the Welsh Fishermen's Association jointly lead a project that reflects the fact that conservation and the fishing industry go hand in hand and places great emphasis on joint management and consultation.



Why update the code?



The current code of conduct for recreational users of the sea in Gwynedd is very old and has dated significantly, so this project aims to develop and distribute a new code for the county (the original code was produced in the year 2000 by the Friends of Cardigan Bay). Following the success of a similar process in Ceredigion recently, discussions were undertaken with the relevant officials and an agreement was put in place to share the same code, or at least use theirs as a basis for a new Gwynedd code. This has avoided duplication and will keep consistency across the bay. A new code was drafted for consultation and was issued to the relevant stakeholders and the general public.



Cod Morol Ceredigion

Yn gyffredinol, byddwch yn wyladiwrus a chadwch ynhell draw o fywyd gwylt. Peidiwch â mynd at farnelliaid môr, gadewch iddynt ddbod atoch chi. Mae pentiroedd megis Mlwt, Aberporth, Ynys Lochlyn a Cheinewyd yn fannau pwysig i ddiolffiniaid a llamhidyddion fwyd; byddwch yn ofalus iawn wrth deithio'n araf a pheidio ag aflonyddu ar anifeiliaid yn y mamau hyn. Byddwch yn ofalus wrth lwyio cychod, gan sicrhau diogelwch y teithwyr a pharchu pobl eraill sy'n defnyddio'r môr.

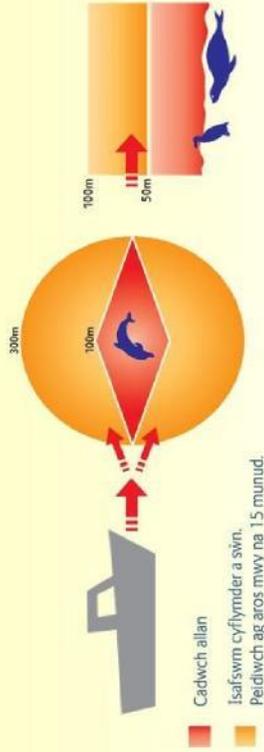
Dolffiniaid, Llamhidyddion a Morloi

Os dewch chi ar draws y creaduriaid hyn yn y môr:

- Arafwch yn raddol i'r cyflymder isaf posib. Peidiwch â newid eich cyflymder na ch cwrs yn sydyn.
- Peidiwch â llywio'r cwch yn syth atynt na mynd yn nes na 100 metr.
- Peidiwch â cheisio cyffwrdd y creaduriaid, eu bwydo na noffo â hwy.
- Byddwch yn arbennig o ofalus wrth osgoi aflonyddu ar anifeiliaid gyda rhai ifainc.
- Peidiwch â mynd at forloi sy'n gorffwys ar y lan, a pheidiwch â mynd i mewn i ogofâu môr yn y tymor lloea (1 Awst tan 31 Hydref).
- Peidiwch â thafli sbwriel na chyfarpar pysgota i'r môr.
- Peidiwch a gwneud unrhyw sŵn diangen ger yr anifeiliaid.

Adar

- Cadwch draw o'r clogwyni yn y tymor bridio, 1 Mawrth – 31 Gorffennaf.
- Peidiwch â gwneud unrhyw sŵn diangen yn agos i'r clogwyni.
- Cadwch draw o heidiau adar sy'n gorffwys neu'n bwydo ar y môr.



Mae'r Cod hwn yn berthnasol i bob llong a chwch hamdden yn cynnwys cychod modur, cychod hwylio, dirigs, badau personol, caeau a chamnod. Dylech gydymffurfio â phob cais gan gychod patrilo lleol a bod yn ymwybodol o derfynau cyflymder o amgylch traethau ymrochi a safleoedd bywyd gwylt, yn enwedig rhwng Ceinewydd a Llengranog a rhwng Ynys Aberteifi ac Aberporth.

Noder fod Harbwrfastrï a Swyddogion Rheoli Lansio Ceredigion wedi'u hawdurdodi i dymu thwyddedau lansio arnog oddi ar gychod ac unigolion nad ydynt yn cadw at reoliadau lleol, is-ddeddfau neu God Morol Ceredigion. Mae'n drosedd i aflonyddu'n fwriadol neu'n ddi-hid ar unrhyw rywogaeth a warchodir (megis dolffiniaid).

Ceredigion Marine Code

In general keep a good look out and keep your distance. Do not approach marine mammals, let them come to you. Headlands such as Mlwt, Aberporth, Ynys Lochlyn and New Quay are very important feeding areas for dolphins and porpoises; take extra care to travel slowly and not to disturb animals in these areas. Please operate all boats with care and attention for the safety of occupants and respect for all other sea users.

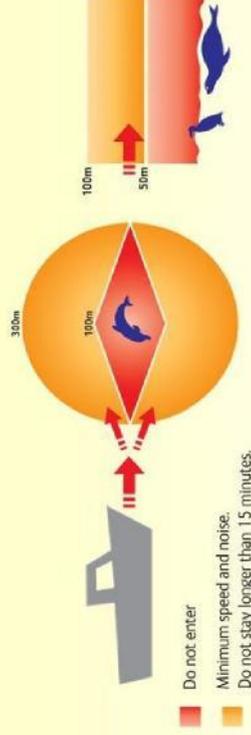
Dolphins, Porpoises & Seals

If these creatures are encountered at sea please:

- Slow down gradually to minimum speed. Do not make sudden changes in speed or course.
- Do not steer directly towards them or approach within 100m.
- Do not attempt to touch, feed or swim with them.
- Take extra care to avoid disturbing animals with young.
- Do not approach seals resting on the shore, and do not enter sea caves during the pupping season (1st August to 31st October).
- Do not discard litter or fishing tackle at sea.
- Avoid any unnecessary noise near the animals.

Birds

- Keep out from cliffs in the breeding season, 1st March – 31st July.
- Avoid any unnecessary noise close to cliffs.
- Keep clear of groups of birds resting or feeding on the sea.



This code applies to all recreational vessels including motor boats, yachts, dinghies, personal watercraft, kayaks and canoes. Always comply with requests from the local patrol boats and be aware of speed restrictions around bathing beaches and wildlife sites, especially New Quay to Llengranog and Carigan Island to Aberporth.

Note that Ceredigion Harbourmasters and Launch Control Officers are authorised to withdraw launching and/or mooring permits from vessels and individuals not observing local regulations, byelaws or the Ceredigion Marine Code. Deliberate or reckless disturbance of any protected species (such as dolphins) is a criminal offence.

A new draft for Gwynedd



Côd Morol Gwynedd Marine Code

Byddwch yn wyladwrs gan gadw draw o fywyd gwylt. Peidiwch â mynd at famaliaid môr, gadewch iddynt ddod atoch chi! Byddwch yn ofalus wrth lwyrio cychod, gan sicrhau diogelwch y teithwyr a pharchu pobl eraill sy'n defnyddio'r môr.

Dolffiniaid, Llamhidyddion a Morloi

- Os dewch chi ar draws y creaduriaid hyn yn y môr:
- **Arafwch** yn raddol i'r cyflymder isaf posib. Peidiwch â newid eich cyflymder na'ch cwrs yn sydyn.
 - **Peidiwch** â llywio'r cwch yn syth atynt na mynd yn nes na 100 metr.
 - **Peidiwch** â cheisio cyffwrdd y creaduriaid, eu bwydo na noffio â hwy.
 - **Byddwch** yn arbennig o ofalus wrth osgoi aflonyddu ar anifeiliaid gyda rhai ifainc.
 - **Peidiwch** â mynd at forloi sy'n gorffwys ar y lan, a pheidiwch â mynd i mewn i ogofâu môr yn y tymor lloea (1 Awst tan 31 Hydref).
 - **Peidiwch** â thafu sbwriel na chyfarpar pysgota i'r môr.
 - **Peidiwch** a gwneud unrhyw sŵn diangen ger yr anifeiliaid.

Adar

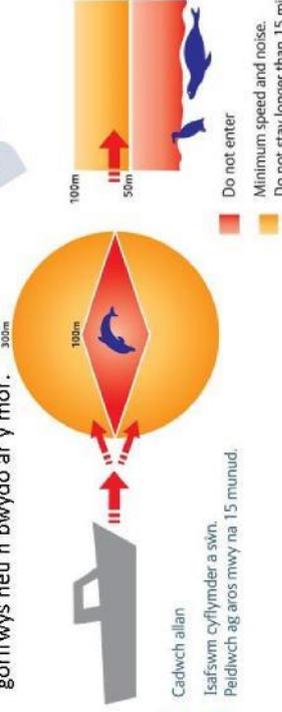
- **Cadwch** draw o'r clogwyni yn y tymor bridio (1af o Fawrth – 31 Gorffennaf).
- **Peidiwch** â gwneud sŵn diangen wrth y clogwyni.
- **Cadwch** draw o heidiau adar sy'n gorffwys neu'n bwydo ar y môr.

Birds

- **Keep out** from cliffs in the breeding season (1st March – 31st July).
- **Avoid any unnecessary noise** close to cliffs.
- **Keep clear** of groups of birds resting or feeding on the sea.

Dolphins, Porpoises & Seals

- If these creatures are encountered at sea please:
- **Slow down** gradually to minimum speed. Do not make sudden changes in speed or course.
 - **Do not steer** directly towards them or approach within 100m.
 - **Do not attempt** to touch, feed or swim with them.
 - **Take extra care** to avoid disturbing animals with young.
 - **Do not approach** seals resting on the shore, and do not enter sea caves during the pupping season (1st August to 31st October).
 - **Do not discard** litter or fishing tackle at sea.
 - **Avoid any unnecessary noise** near the animals.



Mae'r côd hwn yn berthnasol i bob llong a chwich hamdden yn cynnwys cychod modur, cychod hwylio, dngis, badau personol, caiacau a chanwod. Dylech gydymffurfio â phob cais gan gychod patrolio lleol a bod yn ymwybodol o derfynau cyflymder o amgylch traethau ymddrochi a safleoedd bywyd gwylt. Noder fod Harburfeistri a Swyddogion Rheoli Lansio Gwynedd wedi'u hawdurdodi i dynnu trwyddedau lansio a/neu angori oddi ar gychod ac unigolion nad ydynt yn cadw at reoliau lleol, is-ddeddfau neu God Morol Gwynedd Mae'n drosedd i aflonyddu'n fwriadol neu'n ddol-hid ar unrhyw rywogaeth a warchodir (megis dolffiniaid).

This code applies to all recreational vessels including motor boats, yachts, dinghies, personal watercraft, kayaks and canoes. Always comply with requests from the local patrol boats and be aware of speed restrictions around bathing beaches and wildlife sites. Note that Gwynedd Harbourmasters and Launch Control Officers are authorised to withdraw launching and/or mooring permits from vessels and individuals not observing local regulations, byelaws or the Gwynedd Marine Code. Deliberate or reckless disturbance of any protected species (such as dolphins) is a criminal offence.

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Prosiect Ecosystemau Morol

Marine Ecosystems Project

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Consultation



Drop-in Session - 29th of August, 2015

A drop-in session was held on August the 29th, 2015, at Plas Heli, Pwllheli to discuss the draft. The draft and the drop in session were promoted on our social media sites and a copy of the draft was sent to water sports/adventure clubs, local maritime organizations, fishermen and Councillors. The Project Officer and a fisherman (Steering Group member) were interviewed on BBC Radio Cymru, an advert was broadcasted on 'Pnawn Da' and 'Heno' on S4C, and an article was released to the press and appeared in the 'Caernarfon and Denbigh Herald'. An invitation was extended to anyone interested to come and voice their opinions or share any suggestions about the draft, and there were 30 attendees on the day.

From the session

See below the comments and suggestions offered by the 30 attendees in the drop-in session.

Layout and Finish:

- It should be A5 and laminated or waterproof so it could be taken on boats, with the English and Welsh back to back rather than on the same page
- It is very difficult to read the writing on the bottom of the page, especially the English text
- Add Sea bass size limit on the code (Europe 40cm)
- Add the recreational minimum landing size
- Add a basic health and safety checklist (anchor, functioning lifejackets, radio, sufficient amount of fuel, flares)
- Include an advert for a boat handling course on the code – apparently the Diving Club offer these courses



Promotion:

- Distribute in popular launching sites such as Abersoch and Pwllheli (near Pontoon) and leave copies at Pontoon Club
- Display the code in launching sites e.g. interpretation boards
- Put the code on the sailing club's website other relevant sites
- Include the code in the Marina Office Handbook
- Include the code on local Tide Timetable
- Include the code inside GPS cover
- Stickers on boats to promote the code, 'this boat follows the code'
- Display the code at Plas Heli (Welsh National Sailing Academy and Event Centre)

Other Issues:

- Is the launch site near Pontoon Club monitored?
- There is a great deal of angling litter at Carreg y Defaid (plastic baits etc.)
- Angling litter can be bad in Pwllheli
- Illegal netting takes place regularly - e.g. Carreg yr Imbill (Pwllheli)



Cod Morol Gwynedd

W T I M

Byddwch yn wyladwrus gan gadw draw o fywyd gwylt. Peidiwch a mynd at famaliaid mar, gadewch iddynt ddod atoch chi. Byddwch yn ofalus wrth Iywio cychod, gan sicrhau diogelwch y teithwyr a pharchu pobl eraill sy'n defnyddio'r mar.

Dolffiniaid, Llamhidyddion a Morloi

Os dewch chi ar draws y creaduriaid hyn yn y m8r:

- . **Arafwch** yn raddol i'r cyflymder isaf posib. Peidiwch 5 newid eich cyflymder na'ch cwrs yn sydyn.
- . **Peidiwch a** Ilywio'r cwch yn syth atynt na mynd yn nes na 100 medr.
- . **Peidiwch a** cheisio cyffwrdd y creaduriaid, eu bwydo na nofio 5 hwy.
- . **Byddwch** yn arbennig o ofalus wrth osgoi aflonyddu ar anifeiliaid gyda rhai ifainc.
- . **Peidiwch** 5 mynd at forloi sy'n gorffwys ar y Ian, a pheidiwch 5 mynd i mewn i ogof5u mew yn y tymor Iloea (1 Awst tan 31 Hydref).
- . **Peidiwch** 5 thaflu sbwriel na chyfarpar pysgota i'r m8r.
- . **Peidiwch** 5 gwneud unrhyw swm diangen ger yr anifeiliaid.

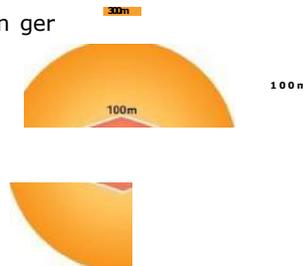
Mae'r cod hwn yn berthnasol i bob !long a chwch hamdden yn cynnwys cychod modur, cychod hwylio, dingis, badau personol, caiacau a chanirod. Dylech gydymffurfio phob cais gan gychod patrolio lleol a bod yn ymwybodol o derfynau cyflymder o amgylch traethau ymdrochi a safleoedd bywyd gwylt.

Adar

- **Cadwch** draw o'r clogwyni yn y tymor bridio (1af o Fawrth — 31 Gorffennaf).
- **Peidiwch a** gwneud sin diangen wrth y clogwyni.
- **Cadwch** draw o heidiau adar sy'n gorffwys neu'n bwydo ar y mon



Cadwch allan
Isafswm cyflymder a sWn.
Peidiwch ag aros mwy na 15 munud.



1'1641164

Noder fod Harbwrfeistri a Swyddogion Rheoli Lansio Gwynedd wedi'u hawdurdodi i dynnu trwyddedau lansio a/neu angori oddi ar gychod ac unigolion nad ydynt yn cadw at reoliadau lleol, is-ddeddfau neu God Morol Gwynedd. Mae'n drosedd i aflonyddu'n fwriadol neu'n ddi-hid ar unrhyw rywogaeth a warchodir (megis dolffiniaid).

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Prosiect Ecosystemau Morol

Marine Ecosystems Project

The next step:

The new code will be distributed to everyone who's registered a powerboat or jet ski in Gwynedd and this project will investigate the possibilities regarding raising awareness and distribution of the code. The project will aspire to educate all recreational users of the importance of obeying by the code and will aim towards ensuring a haven for all wildlife in the Special Area of Conservation.



Gwynedd Marine Code

In general keep a good look out and keep your distance. Do not approach marine mammals, let them come to you. Please operate all boats with care and attention for the safety of occupants and respect for all other sea users.

Dolphins, Porpoises & Seals

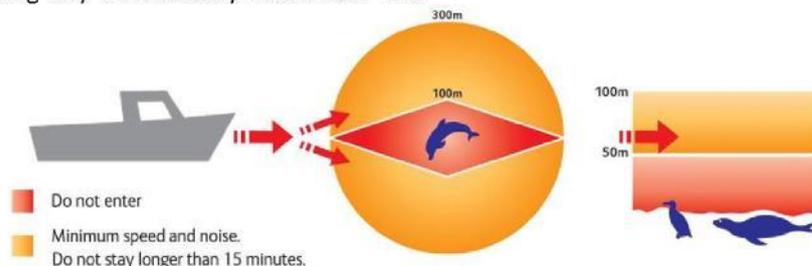
If these creatures are encountered at sea please:

- **Slow down** gradually to minimum speed. Do not make sudden changes in speed or course.
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- **Take extra care** to avoid disturbing animals with young.
- **Do not** approach seals resting on the shore, and do not enter sea caves during the pupping season (1st August to 31st October).
- **Do not** discard litter or fishing tackle at sea.
- **Avoid** making any unnecessary noise near the animals.

This code applies to all recreational vessels including motor boats, yachts, dinghies, personal watercraft, kayaks and canoes. Always comply with requests from the local patrol boats and be aware of speed restrictions around bathing beaches and wildlife sites.

Birds

- Keep out from cliffs in the breeding season (1st March – 31st July).
- Avoid making any unnecessary noise close to cliffs.
- Keep clear of groups of birds resting or feeding on the sea.



Note that Gwynedd Harbourmasters and Launch Control Officers are authorised to withdraw launching and/or mooring permits from vessels and individuals not observing local regulations, byelaws or the Gwynedd Marine Code. Deliberate or reckless disturbance of any protected species (such as dolphins) is a criminal offence.





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Appendix 6.e Liaison, engagement and awareness rising

i. In the press

Swydd newydd sbon



Catrin

Ers tua mis bellach rwyf wedi dechrau gweithio fel Swyddog Prosiectau Ecosystemau Mudi Llyn. Cyn hynny roddwn yn gweithio fel Swyddog Prosiectau i Ardal o Harddwch Naturiol Lethriadol Llyn. Dwy swydd ym maes cadwraeth amgylcheddol. Mae fy swydd bresennol yn swydd newydd sbon ianli, felly roddwn yn gweld y Llan yn cynnig cyfle gwych i mi egluro tipyn bach wrth hwl Llyn beth yn union y mae'r swydd yma'n ei olygu.

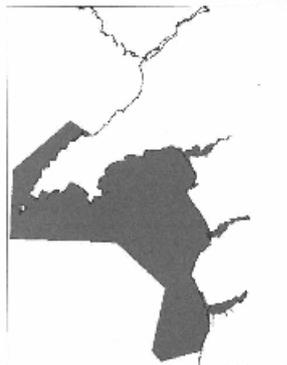
Mae'r hyd (andwyr) o amgylch Llyn yn gyfoethog iawn ac yn hynod o amaref. O ganlyniad i'r amrywioldeb yng ngwely'r môr a chynffinoedd, a'r anifailiaid a'r planhigion hynod sy'n byw yma, mae Pen Llyn a'r Sarnau wedi'u umddefnyddio fel Ardal Cadwraeth Arbennig ers blynyddoedd lawer, dynodiad statudol Fwropedd. Fe ddevisir Ardaloedd Cadwraeth Arbennig gan fod ydwynt ras o'r enghreifftiau gorau yn Fwrop o gynffinoedd bywyd gwylh, a chreaduriaid a phlanhigion arbennig sydd angen gofal. Mae'n ardal enfawr sy'n cynnwys Pen Llyn tua'r gogledd, riffina'r Sarnau tua'r de, a'r aberoedd mawr ar hyd arfordir Meirionnydd a bylled Ceredigion.

Crofwyd fy swydd i yn dilyn dogfen a luniwyd gan Gyndeithas Pysgotwyr Cymru oedd yn cynnig dull o reoli'r môr fyddai'n gwella ein dealltwriaeth o'r amgylchedd morol ac yn hyrwyddo adferiad a gwynwch ecosystemau, heb gael effaith niweidiol ar bysgotwyr a chymunedau lleol. Dull fyddai'n gwarchod bywyd diwyllianol ac economaidd a'r un pryd yn diogelu pysgotfeydd traddodiadol a gweithgareddau hamdden. Yn amlwg, mae

unhyw un sydd yn gweud bywoliaeth drwy hysgota yn dymuno dyfodol iach i'r diwydiant am genallactau, a heb fod am weld cynffinoedd eu cynnyrch yn cael eu dinistrio.

Felly mae Ardal Cadwraeth Arbennig Pen Llyn a'r Sarnau a Chymdeithas Pysgotwyr Cymru yn eidd-urwsin y prosiect Gweithredu Ffosystem Llyn. Mae'r prosiect yn adlewyrchu'r ffaith fod cadwraeth a'r diwydiant pysgota yn medru mynd law yn llaw ac yn rhoi pwyslais mawr ar gyd-rculi ac ymgynghori.

Rwyf yn gweithio gyda Swyddog Ardal Cadwraeth Arbennig Pen Llyn a'r Sarnau, Alison Hargrave, a fy mhif i'w i dros y misoedd nesaf fydd ymgynghori gyda'r rhanddeiliaid perthnasol ynglŷn â phrosiectau arloesol yn ymwneud â chadwraeth. Mae ymgynghori gyda physgotwyr Llyn yn mynd i fod yn flaenoriaeth heb os nac oni bai, a gweld beth yw eu gobcithion ynglŷn â chysrcoli'r môr yn effeithiol. Y gwaith ydyw agwrio a chydweithio tuag at welliannau amgylcheddol a fydd o fudd i'r holl rhanddeiliaid a defnyddwyr y môr yn Llyn.



Ardal Cadwraeth Arbennig Pen Llyn a'r Sarnau

Mi fyddwn yn cynnal trafodaethau a gysrsiau yn y dyfodol agos ond am ragor o wybodaeth ynglŷn â'r prosiect hwn cysylltwch â mi ar bob cyrff, ar 01286 679445; catringly@cywraethymedd.gov.

Catrin Glyn

Cynghorydd newydd



Yn dilyn is-etholiad yn ward Morfa Nefyn, sy'n cynnwys Edern, ar y 9fed o Orffennaf, mae Sian Hughes o Forfa Nefyn wedi ei hedol fel cynghorydd newydd i Blaid Cymru ar Gyngor Gwynedd. Cafodd Sian 315 o bleidleisiau, a'r ymgeisydd arall, Wini Jones Lewis, oedd yn sefyll dros Lais Gwynedd, 123 o bleidleisiau. Cafodd yr is-etholiad ei chynnal yn dilyn ethol y cyn-gynghorydd dros y ward, Liz Saville Roberts, yn Aelod Seneddol Dwyfor Meirionnydd yn yr Etholiad Cyffredinol ddechrau mis Mai.

"Mae'n anhyddad i mi gael fy ethol gan drigolion Morfa Nefyn ac Edern i'w cynrychioli ar Gyngor Gwynedd," meddai Sian. "Diolech o waselod calon i hawb a ddaeth allan i fwrw'u pleidleisiau dangos eu cefnogaeth i mi. Mi fu hi'n ymgrech bositif a dw i'n ddiolchgar iawn i'r llin lleul sydd wedi bod wrth'n fy nghynorthwyo dros yr wythnosau diwethaf, gan gynnwys y cyn-gynghorydd dros y ward, Liz Saville Roberts, sydd bellach yn Aelod Seneddol prysur. Dw i'n edrych ymlaen yn fawr at ddechrau ar y gwaith ac ynnuo â thim Plaid Cymru Gwynedd sy'n arwain y Cyngor. Fy ngobaith fydd cynrychioli pobl fy ardal a chydweithio â nhw i ddat a llewyrchi i'r ardal."

Yn ôl Arweinydd Grŵp Plaid Cymru ar Gyngor Gwynedd, Y Cynghorydd Dyfed Edwards: "Rydym yn llawenhu bod cynghorydd ifanc hrdwlydig yn ynnuo â chris Plaid Cymru ar Gyngor Gwynedd i gynrychioli rhai o drigolion Llyn. Mae pobl Morfa Nefyn ac Edern wedi rhoi eu hynuliriedaeth yn Sian Hughes, ac fel merch leul, bydd yn sicr o ddat a phrofiad o'r maes iechyd, anableddau a phlant a phobl ifanc gyda hi i'r Cyngor. Mae hi'n ferch ei milltir sgwâr sy'n adnabod yr ardal a'i phebl wrth ethol allan, ac felly bydd yn sicr o weithio'n ddiflino dros ei chymuned."

"Mae'n gyfnod heriol i lywodraeth leul oherwydd toriadau dybryd i wasanaethau cyhoeddus ddatw gan y Torkaid yn San Steffan. Er gwaetha'r caledi, yms yng Ngwynedd rydym yn parhau yn uchelgaisiol dros ein trigolion, gan geisio sicrhau bod Gwynedd yn parhau yn lle da i fyw, gweithio a mwynhau ein hunau."

Mae gan Blaid Cymru 38 cynghorydd yn awr, sydd yn fwyafirf elir, wrth gynrychioli pobl Gwynedd yn y Cyngor.

O'r datganiad i'r wsg

MARCHNAD

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NEJADD GOFFA SARN

10 tan 2

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Grŵp Datblygu Cymaladwy
ARW Llyn

Nesa: Dydd Sadwrn, Gorffennaf 4

Marchnad ydy hon lle gall pobl sy'n cynhyrchu yn Llyn ddat a chynnyrch o bob math i'w werthu.

Gallwch dreialu a gwerthu eich cynnyrch eich hun. Daw pobl yno i siopa am fwyd, felly, oes gennoch chi bysgod neu datw newydd i'w werthu? Pris standin yn y Farchnad yw £10.

I gael rhagor o wybodaeth neu archebu standin cysylltwch â Sian Davies ar 07969554898

Dewch i brynu a gwerthu cynnyrch lleol

Code of conduct in the sea

DO you use the sea in the Cardigan Bay area as part of a water sports club, launching boats or just for your own leisure use?

If so, the Pen Llyn a'r Sarnau Special Area of Conservation in partnership with Gwynedd Council, will be staging a drop in session which will provide you with an opportunity to have your say on the new code of conduct for recreational sea users in the area.

A drop in session will be held on Saturday, August 29 in Plas Heli, Pwllheli.

Catrin Glyn, Gwynedd Council Marine Ecosystems Project Officer said: "As the code of conduct for recreational use of the sea in the Cardigan Bay area that's in place at the moment has dated slightly, we're eager to develop a new version. These drop-in sessions are an opportunity for people to discuss the new code. We are eager to hear your opinion, and there is a welcome to any of those that might be interested to call by to the session in Plas Heli, Pwllheli."

"There will be an opportunity for anybody to attend the drop in session for a chat and a cup of tea at Plas Heli. Sailing Academy and Events Centre, Pwllheli on Saturday, 29 August between 10am and 4pm. You'll be able to see the new proposed code, and you'll be welcome to offer your comments and suggestions.

● If you are unable to attend, see www.penllynarsarnau.co.uk.

She's a little fighter

BY LYDIA MORRIS
lydia.morris@denbighherald.com
@CliffHerald

A BRAVE little girl suffering with cerebral palsy will take part in a sponsored walk after recently taking her first steps.

Sasha Lee Evans from Blaenau Ffestiniog was diagnosed with the condition at birth - affecting her movement and co-ordination - making it very difficult for her to walk and talk.

But the inspirational eight year old will take on a massive challenge on Saturday, August 22 by walking around her local park to raise money for a new swing at Y Parc in Blaenau Ffestiniog.

Her mum, Tracey Hughes, 29, said: "Sasha loves going to the park like every other little girl but she can only use the baby swings as she is unable to support her self on the others."

"But she has grown too tall to use them now though, so I thought it would be a good idea to get a specially made swing she can use."

"The only problem is that it costs £5,000 so we've decided to raise some money by doing a sponsored walk."

"The condition massively restricts her mobility and she has only just started walking with our support so this will be a big challenge for Sasha."

"Anybody will be able to use the new swing but it will be specially made for those who aren't able to use the unsupported swings."

After raising more than £500 so far, a fun day will also be held on the day at Y Parc to raise as much money as possible to fund the new swing.

Miss Hughes explained Gwynedd Council have also agreed to match any funding Sasha manages to raise for the special swing.

She said: "I was over the moon when Gwynedd Council offered to help us out. It's brilliant news for Sasha - it's one step closer."

"She's so excited, she can't wait to walk around the park."

"We're all so proud of her, it's a massive effort for her to do this."

"She's so strong, she's a little fighter and always so happy - she's not like me at all!"

● Anybody wanting to donate should pick up a sponsor form from Tesco, Porthmadog or any local shop around Blaenau Ffestiniog.

Brave Sasha will defy her Cerebral Palsy and complete a sponsored walk around local park



● Sasha Evans with her brothers (Left) Lleo, nine and (right) Warren, three will do a sponsored walk to raise money for a new swing

● David Nash and his sculpture 'Habitat'



Historic Welsh cedar

A huge cedar tree rescued from Portmeirion has been carved by internationally acclaimed sculptor David Nash and driven 130 miles to help celebrate the 50th anniversary of the University of Warwick.

Entitled "Habitat" the seven metre high column of cedar that has been shaped and carved to look attractive and to provide shelter for birds, bats and insects.

David said: "I chose this site for the sculpture to be a signal for the biodiversity Diamond Wood will become in the future. The sculpture will change over the years, becoming part of the wood's eco-system as it weathers and creatures inhabit it."

The wood used came from a blown down tree that had been growing in the grounds of Portmeirion site of much of the exterior filming of the sixties cult TV series The Prisoner.

The artwork has now been sited at the entrance to the Diamond Wood which is a new plantation on the University campus.

A former artist-in-residence at the University, David Nash is regarded as one of the greatest sculptors working today.

In 1996, while resident on the campus he produced a series of sculptures created from wood.

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Gwaith Siân Alun yn Tonnau



Siân Alun

Un o'r arlunwyr sydd yn cynryd rhan yn Ardangosa'r Hydref yn Tonnau ydi Siân Alun o Fynythia. Mae Siân bellach wedi cwblhau cwrs grudd mewn Celfyddyd Gain yn y Wimbledon College of Art sy'n rhan o Balfysgol Gelf Llundain.

Aeth i Ysgol Fael Gron ac yna Ysgol Betwngog, lle y dechreuodd ei diddordeb mewn celf. Mae'n ddytledus iawn i'w hachrawes Gelf yno, Elin Huws, am gynnal ei diddordeb, ac am ei sbarduno i gario ymlaen i astudio Celf. Aeth i Geleg Meirion Dwyfor, ac yna dilyn y Cwrs Sylfaen mewn Celf yng Ngholeg Menai o dan arweiniad Owain Prendergast. Tra yng Ngholeg Menai fe ddechreuodd arbrofi gydag arddulliau gwahanol, a oedd ar y dechrau, cyfaddelfa Siân, yn ddiploma o her iddi, ond sylweddolodd yn fuan fod yr her yna hefyd yn ei hymestyn o'i ddatblygu fel arlunydd.

Yn ôl Siân, yr oŷon naturiol sydd ar dirwedd hwi ei mebyd yw'r dylanwadol mwyaf ar ei gwaith, ond ar gyfwr y caagliad yna i Tonnau mae porthladdocdd hycham Llŷn hefyd wedi ei hysbrydoli. Mae'r haenau gwahanol sydd yna yn y tirwedd yn ei diddori ac, yn ei thro, defnyddia hithau haenau o wahanol gyfryngau yn ei gwaith i adlewyrchu hynny.

Gubaid Siân yw dilyn gyrfa ym maes y celfyddydau - ac yn y cyfnewid, mae'n chwilio am brofiadau a chyfleoedd i gyfoethogi ei dealltwriaeth o'r tirwedd lleol gyda'r bwriad o fedu plethu hynny i mewn i'w gwaith celf.

Yn eiddardangos â Siân, mae Ruth Jân Evans, gyfa'r phortreadau corig o'r merched Cymreig, a Richard Eastwood o Berth y Gost, sy'n gweithio gyda ulla. Gwibwch draw, felly, yn Tonnau Pwllheli o Hydref 24iun ymluen. Bydd gwledd yno'n cich aron.

I.ho Meirion

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O Ddrws i Ddrws



Feryl Williams yn derbyn ei thystysgrif

Rydym ni'n hynod o falch iud Mantell Gwynedd wedi cydnabod gwaith Feryl Williams, gynt o Forfa Nefyn a bellach o'r Ffôr, a fu'n gwirfoddoli gyda O Ddrws i Ddrws am dros ddeuddeg mlynedd. Fe gafodd ei gwahodd i de bach ym Mhoethmicion a chyflwynwyd tystysgrif iddi gan Rhys Meirion. Rydym ni'n falch iawn ei bod wedi mwynhau ei hun yno. Arwydd bach o werthfawrogiad am ei gwaith diflino i'r mudiad dros yr holl flnyddoedd. Mae Brian Hughes, tystysgrif y mudiad, hefyd wedi cael ei wahodd i ddigwyddiant gan Scottish Power. Mae wedi cael ei enwebu ar gyfer gwoli am ei waith gwirfoddol ac wedi cyrraedd y rhestr fa. Cawn wybod a fu'n llwyddiannus yn ystod y mis. Croesi bysedd!

Mae Bws Arfordir Llŷn yn dal i fynd heb dyll Mawrth, Iar a Sul tan deiwedd Hydref. Felly os nedd ydych chi wedi bod am daith arno, cofiwch fynd yn ystod y dyddiau nesaf! Mae un bws yn gadael Abersoch a'r Hall yn gadael Nefyn am 9.00, 11.00, 1.30, 3.30 a 5.00, ac yn mynd yn ôl o Aherdaron am 10.00, 12.00, 2.30 4.30 a 5.30. Mae pawb sydd wedi bod arno wedi mwynhau eu hunain ac yn rhyfeddu ar hyspwrthwch ein harfordir ni. Mae Shan, Glyn, Paul a Bethan, y gyrrwyr, yn hynod o glân a chymwynasgar. Dim ond ffonio y gastw lle (01758 721777) ac mi ddaw'r bws i'ch nhôl a'ch dantou.

Meinir Jones

Yr hen luniau



Gwerfyl Gregory a'i chaagliad o hen luniau o Forfa Nefyn gafodd eu harddangos yn Amgueddfa Forwrol Nefyn. Mae'r lluniau'n rhoi darlun o sut mae'r ardal wedi newid a datblygu dros y blynyddoedd.

Llun: Dewi Wyn

Pentreuchaf

Yr Ysgol - Croesowen deulu hach newydd o wnebau yn y Derbyn sydd hefo ni drwy'r dydd. Mae Mali Wynne, Ela, Moll, Mali Llŷn, Shun, Tomas, Lexie, Casey, Jac, Cai, Alad, Carr, Alad, Cara, Elin, Mari a Lilly wedi seili'n arbennig yn ein mysg.



Teulu newydd y Dosbarth Derbyn

Rydym hefyd yn croesawu Miss Fflur Williams yn ei hâl ar ôl bod ar gyfnod mamulaeth i'w dymuno'r gorau i Miss Lisa Jones yn ei swydd newydd yn Ysgol Llanaelhaearn. Byddwn yn ei gweld o ddi i dro eto rwy'n siwr. Croeso hefyd i Mes Eleri Jones yn gymhothydd yn y Cyfnod Sylfaen. Erbyn hyn mae pawb yn bwrw iddi i'w themâu newydd. Mae plant y Cyfnod Sylfaen clasoedd wedi bod ar eu gwiblaith i Fferm Y Ffritid i weld cwmni Oinc Oinc ar waith ac wedi dotio o weld yr holl foch. Diolch i Ela ac Anest am eu croeso.

Pe hawn i yn artist...Erbyn hyn mae saith deg tri phlentyn a Adran Iau'r ysgol ac Ysgol Llanaelhaearn wedi cael y cyfle arbennig o droedio llinli yng nghwmni'r meistri Colin Siân Evans. Carem fel ysgol ddiolch o galon iddo am fedu trethu tuith mor deifffwddan dros y Swm ac am drefnu tywydd gwych i ni. Roedd yn brofiad hyggulfaulwy a haulodus iawn. Diolch hefyd i Haf Meredith a John Dilwyn Williams, dau ddywydd a swaith y profiad yn felys iawn wrth adrodd hanes yr ymys. Croesawyd John Dilwyn Williams yn ôl i'r dosbarth i gyflwyno lleithiau difyr a diddorol am yr ymys i flnyddoedd hynaf yr ysgol, gan actio a chwarae rôl rhai o'r ymyswyr a'r brenhinuedd a fu yno. Bydd y gweithdai yn parhau yn yr Hydref ym Mhais Glyn y Weddw.

Diolch i Catrin Glyn ddaeth fel ymwelydd atom i gyflwyno amfeliailid sydd yn byw ar yr arfordir hynod yma yn Mhen Llŷn. Cawsom luniau gan Carin o'r morlo llwyd cyn ein gwibdaith ar y cwch ac roddi cael eu gweld yn eu holl ogoniant a chael y cyfle prin o weld morlo bach newydd anodig yn anhyguel. Cafodd yr Ysgol ei dewis i fod yn rhan o raglen Dylan Jones ar Rygbi Cymru'r Byd. Dewiswyd Japan fel gwlad i ni ei dilyn. Bu Celt ar y radio ac Owen William yn dilyn gem gyntaf anfarwol Japan. Mae genym lawer o ddilynwyr pybyr iawn i ddiu ein gwlad yn ogystal.

Y tymor yna rydym yn ffodus iawn o gael croesawu cwmni newydd sydd yn arwain a chyflwyno gwasanaethau boreol mewn ffordd hwyliog drwy actio. Mae plant y dosbarthiadau i gyl yn mwynhau pan fyddant yn troi ein newydd yn theatr fach dros dro. Ewch i bwr drwy ein cyffwr Twitter am ychwaneg o luniau a hanesion difyr yr ysgol!
(C:yllwdd: Heulwen Hughes ffon: 613978)

ii. Links to videos

Llŷn and the ecosystem approach - An overview of projects on Llŷn which have been funded in 2015 through the Welsh Government's Nature Fund

<https://www.youtube.com/watch?v=MtFUeaK4erk>

Porthdinllaen Seagrass

<https://www.youtube.com/watch?v=dZ-0RIgnTVE>

Marine Ecosystems Project

<https://www.youtube.com/watch?v=17Evn6TAxaw>

Appendix 6.f References

Woo, J & Woolmer, A. 2014. *The Ecosystem Approach in action: global case studies, good practice and lessons learned*. NRW Evidence Report No 36.

<http://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en>

<http://gov.wales/topics/environmentcountryside/consmanagement/natural-resources-management/environment-bill/?lang=en>