mpa
essential materials
sustainable solutions

Biodiversity Action Plan (BAP)

for the UK marine aggregate industry

October 2011

bmapa british marine aggregate producers association

Mineral Products Association

Forewords

Maintaining a steady supply of marine aggregate is essential to our way of life. The challenge is to harness the substantial resource that exists around our shores while protecting all that is best about our marine environment.

mpa essential materials sustainable solutions
bmapa

There has been a seismic shift in our understanding of the effects of marine aggregate extraction, enabled through a range of industry investigations and assessments, as well as wider research initiatives. The resulting improvements in evidence and understanding have in turn allowed more robust measures to be developed to manage and mitigate the pressures created by extraction. The enhanced levels of understanding that have resulted, particularly in terms of marine habitats and their distribution, have made a significant contribution to the ongoing development of the national Marine Protected Area network.

This strategy represents an important part of our wider commitment to sustainable development. Through our BAP, we hope to demonstrate the positive contribution the sector can make towards protecting and enhancing biodiversity. This should be achieved not only through the responsible management and stewardship of the areas where we operate, but also through the improved understanding made possible by the high quality survey data we acquire.

Kevin Seaman, Chairman, BMAPA

Marine aggregate producers have long been at the forefront of efforts to achieve better understanding of marine biodiversity. Our knowledge of the species and habitats in the seas around England has increased significantly in the last few years, in no small part due to evidence provided by the sector. This has allowed designation of marine protected areas (MPAs) to proceed in partnership with development of aggregate extraction activity. Implementation of the BMAPA BAP is a logical next step to progress the core values of sustainable development for the sector. By linking the BAP to the wider sustainability goals of its members, BMAPA will ensure that suitable and appropriate information can be used to manage operations and be provided to other seabed users, regulators, other relevant authorities and advisers. Marine aggregate producers are leading the way in demonstrating marine environmental stewardship.

NATURAL ENGLAND

James Marsden, Director Marine, Natural England

The Wildlife Trusts believe that the seas around the UK have the potential to be among the most productive and wildlife-rich on Earth. Sustainable use of our seas resources is vital if our seas are to recover from past declines.

This means development at sea that has minimal impacts on wildlife and habitats. We welcome the development of Biodiversity Action Plans by the marine aggregates industry and hope they will help the industry to minimise the impacts from aggregates extraction whilst helping to increase our knowledge of marine habitats.

THE wildlife TRUSTS

Stephanie Hilbourne, Chief Executive, The Wildlife Trust

The strategy

A Biodiversity Action Plan (BAP) Strategy for the Marine Aggregate Industry

This document has been produced by the British Marine Aggregate Producers Association (BMAPA) and provides the strategic basis for development of the BMAPA Biodiversity Action Plan (BAP). The Strategy seeks to outline the purpose of the BAP, its objectives, guiding principles, proposed structure and ultimate utility. To date, the BMAPA BAP development proposals have been reviewed by Natural England and The Countryside Council for Wales to ensure that their views are incorporated during the beginning of the process and that the resulting BAP is relevant to marine aggregate extraction operations in English and Welsh waters.

Contents

1. Introduction

Management, maintenance and enhancement of biodiversity are central to current thinking regarding sustainable development and corporate social responsibility. Governments, communities and industry must all consider the implications of their actions on biodiversity to ensure that, where possible, adverse effects on biodiversity are minimised and opportunities for maintenance and enhancement are maximised. The UK marine aggregate industry is no exception and as part of the industry's continued drive towards improved operating practices, BMAPA aims to develop and maintain a biodiversity action plan (BAP) that will assist its members and improve the biodiversity management of marine aggregate extraction sites around the UK.

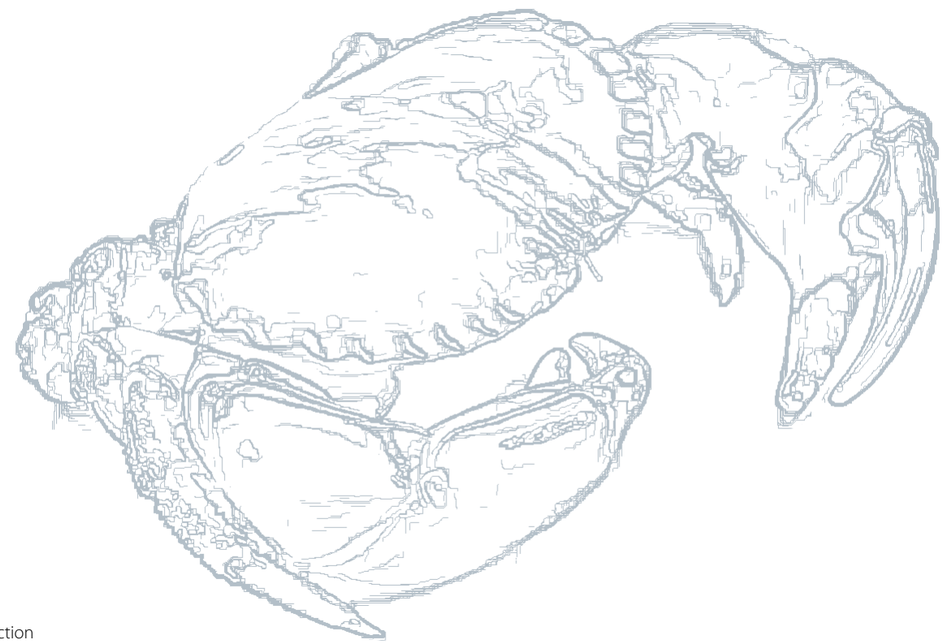
BMAPA is the trade association for the marine aggregate industry in the UK, and part of the wider Mineral Products Association. It represents 11 member companies, who in terms of resource production account for around 90% of the annual UK total. The licence areas operated by the British marine aggregate industry cover 1291km^2 of the UK continental shelf, as of the end of 2010, and by virtue of the regular surveys undertaken by members a vast amount of data describing the seabed habitats and marine species in the vicinity of the licence areas has been acquired. With this in mind, BMAPA believe it is essential that the information acquired and held by members is managed in such a way that the implications of marine aggregate extraction for marine biodiversity is suitably considered and operations are managed in a coherent and sustainable way.

As an addition to BMAPA's existing Sustainable Development Strategy, it is intended that the BMAPA BAP will provide members with a structure when considering ongoing activities and proposals for new dredging areas. Together, these over-arching policies will provide BMAPA members with a framework to ensure that regulatory authorities and organisations responsible for biodiversity management in the UK receive better quality and more relevant information, compatible with their own reporting initiatives.

2. What is biodiversity?

According to the United Kingdom Biodiversity Action Plan (UKBAP), "biological diversity" is the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; and includes diversity within species, between species and of ecosystems.

There are many definitions of biodiversity, and while this one is limited it provides us with a platform for biodiversity assessment. The BMAPA BAP Strategy will consider biodiversity in the context of the marine ecosystem, and how marine aggregate extraction operations should be managed with respect to the biodiversity it contains.



3. Why conserve biodiversity?

This is a fundamental question and one which was addressed by the UK's Biodiversity Partnership in 2007. The reasons for conserving biodiversity presented in that work are reproduced below:

Because our survival depends upon it (life-support services)

Living things, the rocks and soils, water and air interact in a myriad of complex and inter-related ways to provide a range of conditions that favour life on Earth. Removing components from this web-of-life is akin to taking out the rivets from a flying aircraft – it should cause us to worry! Natural species extinction happens and new species also evolve over time. However, human activities have caused extinction rates to increase to 1,000 times the natural level with 12% of birds, 25% of mammals and 32% of amphibians being threatened with extinction over the next century. If the ecological systems that support life on Earth collapse or radically change, our very existence is threatened. Soil biodiversity alone influences a huge range of processes and functions vital to ecosystem services, yet little is known about its response to environmental pressures.

Because our economy and lifestyles depend upon it (products and regulation services)

From the harvesting of fish to the growing of timber, biodiversity provides the source for an enormous range of products we consume and use. Many pharmaceuticals, as well as soaps, starches, rubber, oils, dyes, and fabrics, have been derived from wild plant products – and many more are yet to be discovered. At the larger ecosystem scale, biodiversity plays an enormous role in regulation of the atmosphere, of the water cycle and the nutrient cycles of the soil. From flood control to soil conservation, the annual contribution of these services is worth many trillions of dollars.

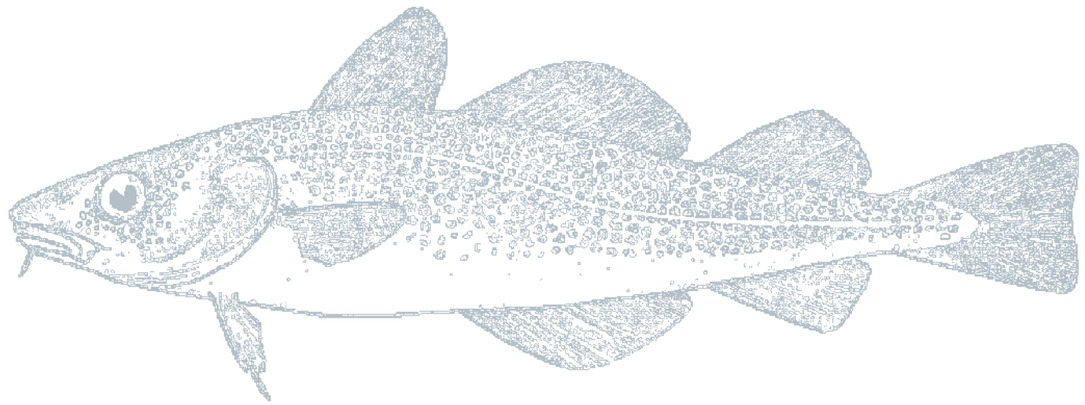
Because to do otherwise is wrong (moral/ethical/philosophical)

Many people think it is wrong to let species go extinct and to treat nature as if it has been designed for our convenience and abuse.

Because it inspires and enriches our lives (aesthetic/spiritual/cultural services)

It enriches many people's lives every day. We are uplifted by nature and our spirit is renewed by contact with it. It provides endless motivation for enquiry, from schoolchildren to scientists.

It is therefore clear that conservation of biodiversity is important both in terms of the health and productivity of the ecosystems upon which society depends, the long term sustainability of businesses and the economy. It is therefore clear that whilst biodiversity management may be a difficult concept to accept, it is important that all members of society are aware of the issue and take steps, however small, to establishing it as a fundamental component of their everyday lives.



Biodiversity Action Plan (BAP) STRATEGY

4. What is a biodiversity action plan?

According to UK Planning, a BAP is a strategy prepared for a local area aimed at conserving and enhancing biological diversity. This definition focuses on the utility of a BAP for a local area but for the purposes of the BMAPA BAP strategy, a plan is being developed to account for consideration of biodiversity on an industry basis, through application of biodiversity action planning at a regional scale.

This raises important issues as whilst there are overall commonalities between marine aggregate producing companies and their operations (e.g. dredging methods, target resources, environmental effects), there are also distinct differences between the regional marine and coastal environments within which they work (habitats, species). The BMAPA BAP Strategy accounts for this and ensures that whilst 'common denominators' in BAP aims and actions are identified, regional differences are also identified and accounted for.

To achieve the goal of developing and implementing an over-arching industry BAP, BMAPA have developed a two stage approach. To begin with, and presented here, a BAP Strategy has been developed. The Strategy outlines the aims and proposed approach to biodiversity management and uses information from ongoing BMAPA initiatives (e.g. Area Dredged reporting programme (in partnership with The Crown Estate), the BMAPA Sustainable Development Strategy, the Archaeological Reporting Protocol (in partnership with English Heritage) and Active Dredge Area Chart information (in partnership with The Crown Estate)) to ensure that the BAP process enhances their utility.

The BAP Strategy also describes national programmes for biodiversity management, and protected sites such as SACs, SPAs, SSSIs and the forthcoming network of Marine Conservation Zones which are crucial to protecting and enhancing biodiversity. It considers how the BMAPA BAP might best be developed and applied to ensure that cross compatibility of information is possible. The second stage of the process is the development and implementation of the BAP itself following the proposed structure presented herein.

5. The strategy for development and implementation of the BMAPA BAP

For the BMAPA BAP to achieve its full potential, a carefully considered development and implementation strategy is required. This will ensure that the BAP is both realistic in its objectives and that it provides valuable guidance not only to marine aggregate extraction companies, but also to those organisations tasked with regulating and monitoring the activities and impacts of the industry. The strategy for BAP development and implementation is described in the sections below.

5.1. The objective of the BMAPA BAP

The objective of the BMAPA BAP initiative is to develop the necessary structure and processes to enable a robust and consistent approach to be undertaken by the sector when considering biodiversity issues at national, regional and local scales.

The evolution of the UK Government's Marine and Coastal Access Act 2009, and the associated development of a network of Marine Protected Areas, means that proactive industry-led initiatives that are able to pull together and deliver best practice for sectoral marine interests will become increasingly important in helping support delivery of Government policy relating to sustainable marine use, including Marine Spatial Planning.

In adopting an industry-wide approach to considering biodiversity, operators will benefit from a common structure to enable this important issue to be delivered, while regulators and their advisors will benefit from a consistent, industry wide approach to reporting. In turn, this should result in more consistent advice to marine aggregate companies regarding management and mitigation measures.

5.2. The BMAPA BAP in the context of national biodiversity and conservation management initiatives

The BMAPA BAP will need to be developed with due regard for wider biodiversity initiatives so that the BAP and its outputs provide wider value to biodiversity management. As a first step, the following biodiversity initiatives have been identified as having relevance to the objective of the BMAPA BAP.

5.2.1. The UK Biodiversity Action Plan

The UK BAP is the UK Government's response to the Convention on Biological Diversity (CBD). The Convention called for the development and enforcement of national strategies and associated action plans to identify, conserve and protect existing biological diversity, and to enhance it wherever possible. The UKBAP describes the biological resources of the UK and provides detailed plans for conservation of these resources, at national and devolved levels. Action plans for the most threatened species and habitats have been set out to aid recovery, and reporting rounds show how the UKBAP has contributed to the UK's progress towards the significant reduction of biodiversity loss called for by the CBD.

The shared vision for UK Biodiversity conservation adopted by both the devolved administrations and the UK government is set out in the framework: "Conserving Biodiversity – the UK Approach". This sets out the future priorities for UK conservation and provides a more holistic view of ecosystem conservation, protection, and sustainable use of the UK's biological resources.

Since its inception, the UK BAP has been subject of a number of updates following review. The most recent update for England was published by Defra in August 2011. Entitled 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services', it defines an ambitious biodiversity strategy for England for the next decade.

5.2.2. The UK Biodiversity Partnership

The UK Biodiversity Partnership seeks to implement the UKBAP, but in 2002 the UK Biodiversity Group was succeeded by the UK Biodiversity Partnership Standing Committee, which better reflected the devolved lead by countries and their new biodiversity strategies. The Partnership aims to bring together all the partners involved with, or with an interest in, the UK Biodiversity Action Plan and its policies on biodiversity, and to co-ordinate actions that should be taken forward at a UK level.

Since its implementation, the UK BAP has been modified to account for the new responsibilities of the UKs devolved administrations. Each of the devolved administrations has established a biodiversity management partnership and these organisations now oversee monitoring and reporting of biodiversity in their respective administrative areas. Considering that all present marine aggregate extraction activity occurs within English or Welsh waters, the remit and responsibility of the respective biodiversity partnerships is considered below.

5.2.3. England Biodiversity Group

The England Biodiversity Group, which involves stakeholders from public, private and the voluntary sectors, advises the Government on the implementation of the UKBAP in England. In particular, it oversees development and delivery of the Biodiversity Strategy for England as set out in 'Working with the grain of nature' The Group is chaired by Defra who provide its secretariat thorough the Biodiversity Policy Unit.

The England Biodiversity Group's aim is to promote the conservation and enhancement of biodiversity in England within the framework set by the UKBG and with the full co-operation of partners at the national, regional and local levels.

In particular, the Group:

- Develops and leads delivery of the Biodiversity Strategy for England as part of the UK Biodiversity Action Plan;
- Identifies resource requirements for implementation and assists in securing funds for the England Biodiversity Strategy;
- Is the focal point for biodiversity partnership in England;
- Provides a conduit for the transmission of information to and from the national, regional and local levels;
- Seeks to promote public understanding and awareness of biodiversity.

The England Group delivers its remit by:

- inviting membership from a wide range of partners and sectoral interests in biodiversity;
- Establishing a programme of work to take forward the England Biodiversity Strategy and address cross cutting issues between workstreams;
- Encouraging the adoption by all its members of common principles towards the operation of their policies and programmes as they affect biodiversity;
- Working with other UK country groups to create and introduce a framework for monitoring and reporting of biodiversity, which encompasses local and national information, to form coherent UK and national pictures; and,
- Developing and overseeing delivery of a strategic programme of actions to ensure biodiversity is fully integrated as part of Sustainable Development in all its aspects – economic, environmental and social.

5.2.4. Wales Biodiversity Partnership

The Wales Biodiversity Partnership brings together key players from the public, private and voluntary sectors to promote, monitor and deliver biodiversity actions in Wales. The delivery mechanisms are organised, steered and facilitated by the steering group, the wider partnership and the support team.

The WBP consists of a wide network of people who have a role to play in biodiversity conservation in Wales. It includes all LBAP Partnership members, all staff of Local Record Centres, all Association of Local Authority Ecologists (ALGE) members and all Biodiversity Champions from Local Authorities/National Parks. In addition it includes all those who have so far applied to become members.

The main objective of the Partnership is to enable and deliver biodiversity action. The WBP Steering Group consists of around 30 members chosen from appropriate public, private and voluntary sector groups and organisations in Wales. It has been set up to work on behalf of the Partnership to coordinate Wales level actions. The Steering Group provides a leadership role and is the decision making group; however, it does not act exclusively. The Steering Group makes decisions depending on the advice and expertise available throughout the wider partnership.

The WBP presents its "Mission Statement" or underlying principles as follows:

- Support WBP Steering Group and Wider Network in theirs aims to be; Decisive, Inclusive, Transparent, Responsive, Focused and Effective
- Enable agriculture, fisheries and other industries to promote the use of wild-life friendly, organic, environmentally sustainable production and extraction methods in order to reduce their impact on biodiversity and positively contribute to it's enhancement
- Encourage and support the planning, development and management of species-friendly, habitat-rich buildings, transport and utility infrastructure
- Encourage and support the development and management of large-scale land and sea habitat management including ecological connectivity projects and de-fragmentation of habitats through collaborative action
- Influence national and local government, businesses, voluntary groups, communities and individuals to take account of biodiversity in their activities and to support and take action that contributes to the conservation and enhancement of biodiversity
- Support the gathering and sharing of biodiversity information and reporting on action taken/targets met using Local Record Centres, the Biodiversity Action Reporting System and other mechanisms as required
- Seek out mechanisms for improving funding of biodiversity
- Work to ensure long term sustainability of LBAP Partnerships and their ability to deliver biodiversity action in line with Annex H of the Wales Biodiversity Framework

5.2.5. Marine Protected Areas – Offshore SACs, SPAs and MCZs

According to Defra (2010), the term Marine Protected Area (MPA) has been used to describe a wide range of marine areas which have some level of restriction to protect living, non-living, cultural, and/or historic resources. In the UK, MPAs have primarily been set up to help conserve marine biodiversity, in particular species and habitats of European and national importance. The main types of MPA in the UK are Special Areas of Conservation (SACs) for habitats of European importance, Special Protection Areas (SPAs) for birds, and Marine Nature Reserves (MNRs) for nationally important habitats and species. There are also a number of voluntary and non-statutory MPAs.

In addition to the MPA designations described above, The Marine and Coastal Access Act contains provisions for the creation of a new type of Marine Protected Area (MPA) in England, called a Marine Conservation Zone (MCZ). MCZs will protect nationally important marine wildlife, habitats, geology and geomorphology and can be designated anywhere in English inshore and UK offshore waters. In English inshore and English, Welsh and Northern Irish offshore waters, MCZs will be identified through the Marine Conservation Zone Project. In Welsh inshore waters there will be a small number of MCZs afforded a high level of protection. Sites will be selected to protect not just the rare and threatened, but the range of marine wildlife.

Marine protected areas are one management tool which can:

- protect areas of threatened species and habitats to help ensure biodiversity is not lost as a result of widespread damaging activities,
- protect areas of representative species and habitats to help ensure that they do not become threatened as a result of human activities,
- provide some relatively unaffected areas of high biodiversity value to support the structure and functioning of the wider marine ecosystem.

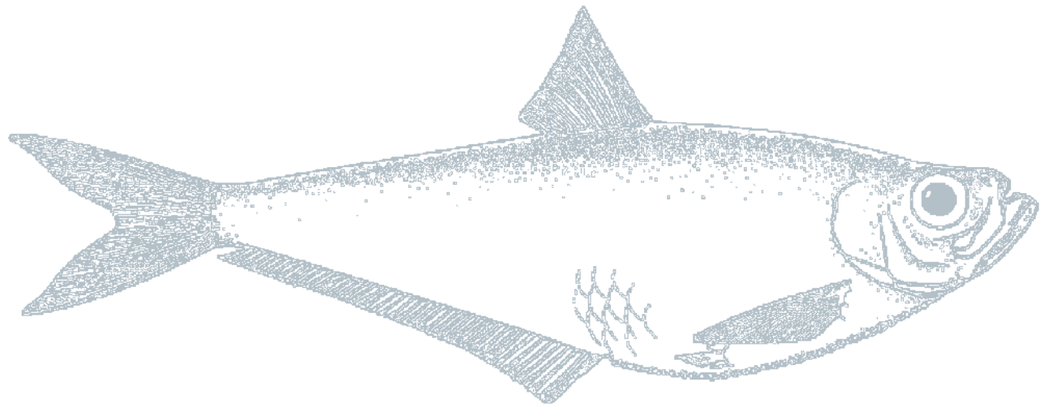
5.3. Development and implementation of the BMAPA BAP

The development strategy for the BMAPA BAP will be directed by the following guiding principles:

- The BAP will be developed to ensure that BMAPA's member companies have a common framework for considering biodiversity during their operations
- The BAP will describe the potential effects of aggregate extraction on biodiversity and implications for conservation of biodiversity
- The BAP will provide information on the priority species and habitats identified in national legislation and guidance documents and their sensitivity to effect of marine aggregate extraction
- The BAP will identify current operational best practice for the purposes of managing the detrimental effects of aggregate extraction and, if possible, promoting the beneficial effects of aggregate extraction and its attendant activities
- The BAP will be developed so that it provides information to other BMAPA assessment and reporting initiatives
- The BAP will be developed with due regard for national biodiversity management programmes and marine protected area initiatives
- The BAP will formalise a reporting and review process that ensures the plan is regularly updated so as to maintain its relevance and value

Implementation on of the BAP will be undertaken as outlined below:

- Issue of the BAP Strategy document
- Completion of the draft BMAPA BAP
- Submission of the draft BAP to Natural England and Countryside Council for Wales for review and comment
- Revision of the draft BAP to account for the comments received
- Issue of the BMAPA BAP
- Initiation of the first reporting and review period



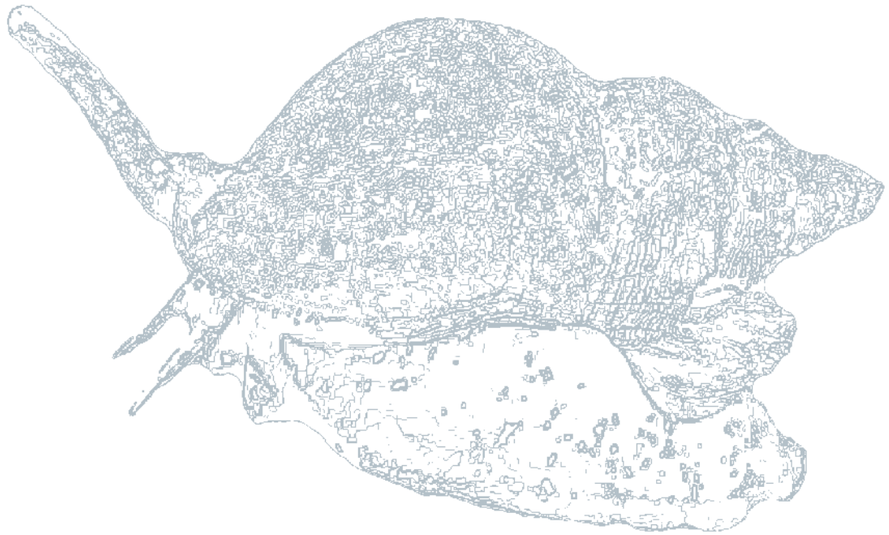
6. The BMAPA BAP in the context of BMAPA's wider approach to sustainable development

BMAPA represents 11 of the UKs marine aggregate production companies that collectively produce around 90% of the national total. The industry recognises that it works in a sensitive environment and accepts its responsibility to operate with care and concern for both the marine ecosystem and other users of the sea. BMAPA believes this challenge should be approached as a partnership with all the other parties involved and actively seeks to engage interested parties in order to develop operating methods that minimise the industry's impact.

BMAPA has in recent years sought to implement strategies and practices that coordinate member's activities and provide a more coherent response to key issues. BMAPA believes this has a tangible benefit not only for members but also for regulatory authorities who must comment on dredging proposals and determine the significance of impacts resulting from dredging. Information generated by initiatives such as the Area Dredged reporting programme (in partnership with The Crown Estate), the BMAPA Sustainable Development Strategy, the Archaeological Reporting Protocol (in partnership with English Heritage) and Active Dredge Area Chart information (in partnership with The Crown Estate) has proved extremely useful to external organisations responsible for regulating and advising on the industry's operations, as well as supporting members management of their activities.

With the UK Government committed to delivering a network of Marine Protected Areas by the end of 2012 as part of its commitment to international and national initiatives, and moves by industry to adopt biodiversity action planning as a central pillar of management activities, BMAPA believes that a marine aggregate industry BAP will perform a valuable strategic function for operators, regulators and their advisors. Applications for licences to dredge and ongoing operation of existing dredging permissions must account for the conservation issues of the site in question – at local, regional and national scales.. Marine aggregate companies undertake site specific assessments of habitats and species, but consideration of biodiversity issues tends to be more limited. The proposed BMAPA BAP will address this issue and will formalise an industry viewpoint with respect to biodiversity. In addition to this, BMAPA will further provide a standardised process that will enable it's members to provide the information required by regulatory bodies with respect to biodiversity.

BMAPA is seeking to develop a BAP that sits at the heart of its wider Sustainable Development commitments, which draw on the outputs of other initiatives, providing an overview of biodiversity issues in the context of marine aggregate extraction and a resource for member companies to inform their individual activities. Once implemented, the BAP will need to be linked to a variety of organisations and information sources to ensure that it is properly informed, that it remains current and that the outcomes of the BAP process inform a range of activities.



Biodiversity Action Plan (BAP) STRATEGY

7. The use of BAP in managing the operations of member companies

The BMAPA BAP Strategy considers information from existing BMAPA initiatives to ensure that, where possible, the BAP enhances their utility and duplication of effort is avoided. Information from relevant national and international programmes of biodiversity management will be reviewed and summarised in the final BAP document to ensure that the development of the BAP is suitably informed. By considering relevant information, the BAP will be suitable for members when assessing the potential impacts of their activities and managing operational extraction licences. BMAPA consider the following points important in generating a practical BAP for the aggregates industry:

i. A list of priority species and habitats requiring consideration during all licence applications. This will include species identified in national and regional designations including Annex 1 species and the section 42 list.

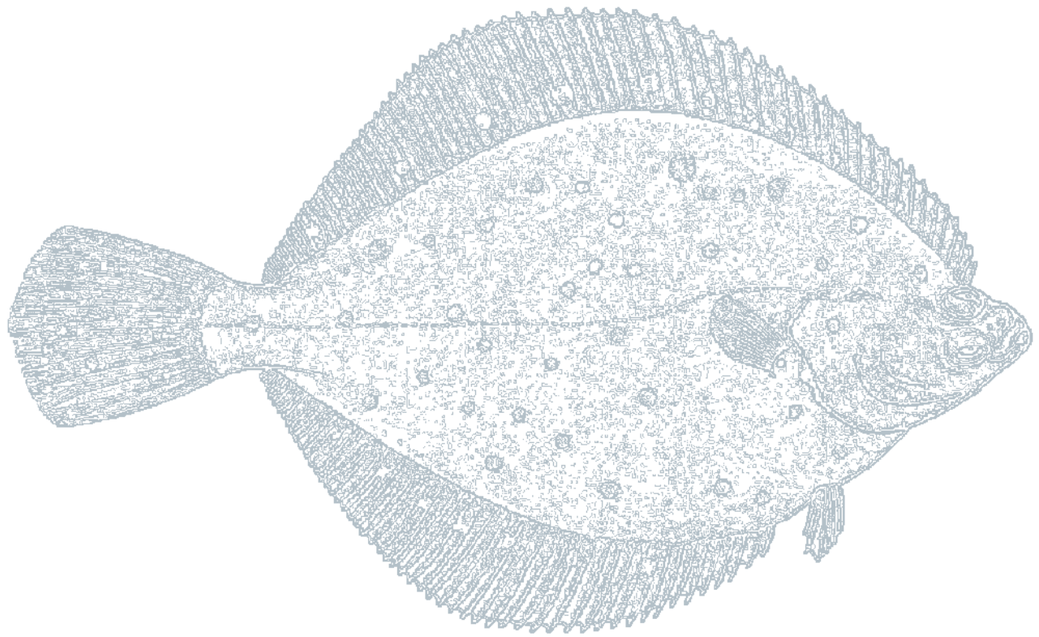
ii. Statements regarding the sensitivity of priority species (described above) and habitats to dredging impacts.

iii. Standardised monitoring protocols and assessment criteria capable of describing biodiversity characteristics of sites targeted by the marine aggregate industry on a regional and national scale, benchmarked against measured impacts.

iv. A list of accepted mitigation measures that are applied when BAP species or habitats are identified within an area influenced by aggregate extraction operations on a regional and national scale.

v. A clear reporting process that not only provides relevant information to support the activities of BMAPA members but that also generates information of use to national and regional biodiversity partnerships in fulfilment of their responsibilities.

By pursuing this approach, it will be possible for companies to draw on the BAP to inform individual licence applications and direct the management of operational extraction sites.



8. The structure of the BMAPA BAP

The BMAPA BAP will have a defined structure that ultimately informs and directs management actions. The BAP will have some principle components, specifically;

i) A statement of intent/purpose

This will outline the reason for developing the BAP, its broad aims/objectives and the outputs of the process.

ii) Terms of reference

The ToR section will identify and describe relevant strategy, policy and planning documentation that will inform the BAP. At the highest level, this will include, but not be limited to; international conventions, national government polices and guidelines, industry strategy and policy documents, broadscale contextual biodiversity/environmental/ecosystem information and relevant Non-Governmental Organisation (NGO) guidance. There will also be a need to identify at this stage, the information that is available at a regional and local level to inform latter stages of the BAP process.

iii) Positioning of the BAP within existing management structures

In order for the BAP to be an effective management tool, its position within existing management structures and relationship to management/operational activities will be determined. How the BAP relates to, and draws on, other BMAPA and broader biodiversity management activities will be key to ensuring its practical utility and to maximising its value in achieving its broad aims/objectives.

iv) Identification of the priority species and habitats for consideration in the BAP

The purpose of a BAP is to 'conserve and enhance' biodiversity. Whilst this over-arching aim is the foundation of the plan, the BAP will be more clearly directed through identification of priority species and habitats and consider the wider structure and function of the marine environment relevant to the species and habitats identified. In this way, the resources required for monitoring and reporting can be better focused on the components of the overall ecosystem that are most sensitive to the influence of aggregate extraction. This phase of the BAP development will be informed by European and domestic legislation with respect to protected species and habitats, national BAP guidance, relevant research regarding the sensitivity of marine organisms to the effect of dredging and the industry data regarding the types of species and habitats that are most likely to be found in the vicinity of aggregate extraction sites.

v) Definition of broadscale aims, supporting activities and actions

On establishing the conservation priorities (outlined above) a table of aims, supporting activities and actions will be developed and common mitigation measures identified for all marine aggregate extraction operations. Supporting activities and actions will be proposed that are specific, measureable, achievable, relevant and timebound (SMART). By using actions to report progress against the aims and supporting activities defined, year on year changes in performance will be tracked and explained, and where necessary appropriate additional responses introduced. That said, for a variety of reasons, it is understood that actions may not be completed within the period proposed and as such the process will be updated to monitor progress and direct future iterations of the BAP.

vi) Definition of regionalised aims, supporting activities and actions

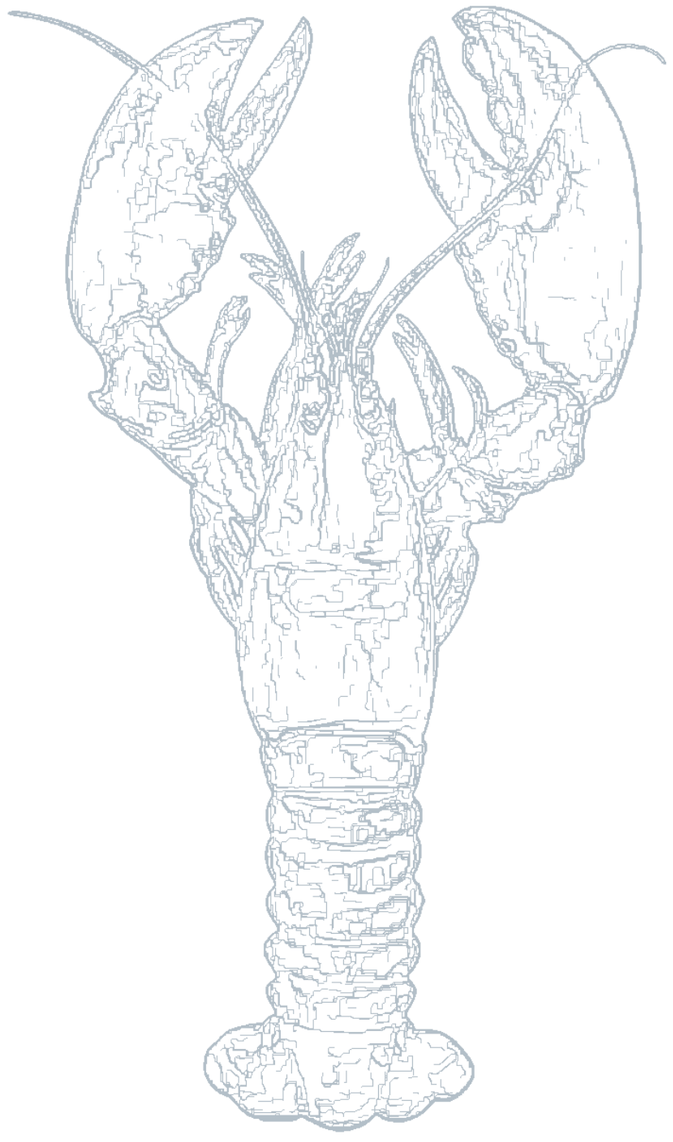
Whilst over-arching industry-wide BAP aims will be developed in stage 6.v, it is likely that a regional approach to delivering the various elements of the BAP process will be required. The industry operates in well defined geographic regions which have distinct ecosystem characteristics. A table of regionalised aims, supporting activities and actions will be developed that account for specific issues in each of the regions where extraction operations occur.

vii) Reporting and review structure

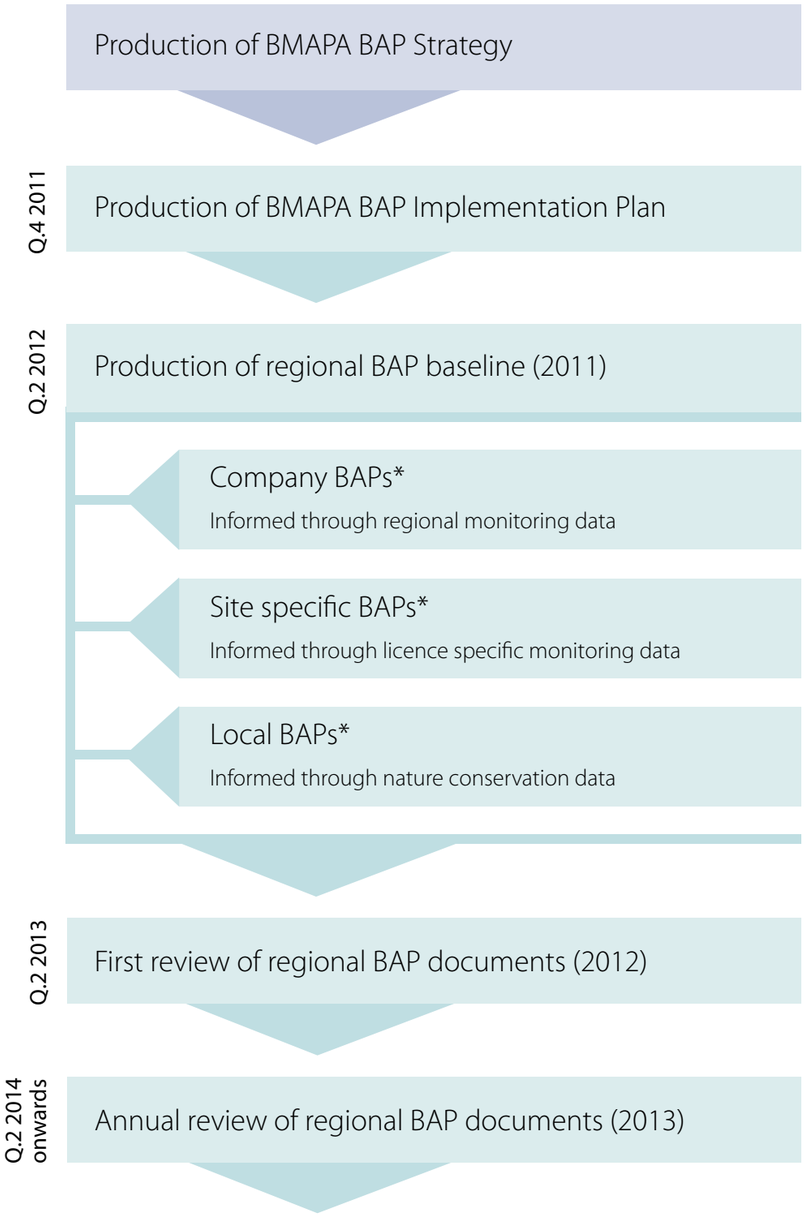
A reporting and review structure will be proposed that defines the scope of BAP update reports and the mechanism for review of aims, supporting activities and actions. It is important at this stage that appropriate and practical timescales for reporting and review are adopted.

viii) Other components of the BAP

In the past BAPs have been informed by specific habitat and species action plans (HAPs and SAPs). As the responsibility for BAP implementation is now devolved, the BMAPA BAP will review and draw on available information produced by relevant authorities to provide the specific information regarding the nature and sensitivities of the priority habitats and species identified in stage 6.iv. The information will be collated into a series of documents describing actions and timescales for helping to deliver the objectives of the local BAPs and used to inform BAP activities.



9. Timescales for completion and implementation of the BMAPA BAP



*where available

Biodiversity Action Plan (BAP) STRATEGY

The Biodiversity Action Plan

Implementation of the Biodiversity Action Plan (BAP) for the Marine Aggregate Industry

From the agreed strategy, we now move on to the Biodiversity Action Plan itself and the manner in which it will be implemented by BMAPA's members. The BAP looks in particular at the physical and biological effects of marine aggregate extraction and identifies the priority species and habitats that need to be considered. We then define aims, supporting activities and actions at both broadscale and regional levels. We also set out a planned reporting and review structure.

Contents

1. Overview

As an issue, biodiversity began to establish itself in the public consciousness in the 1980's. At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy for "sustainable development" -- meeting our needs while ensuring that we leave a healthy and viable world for future generations. One of the key agreements developed in Rio was the Convention on Biological Diversity (CBD) (Secretariat of the Convention on Biological Diversity, 2000). The agreement sets out commitments for maintaining the world's ecological structure and has been ratified by the majority of the world's governments.

Since the establishment of the CBD, biodiversity action planning has emerged as a method of placing the needs of the natural environment at the heart of social, economic and industrial development. Through consideration of biodiversity during development planning, the long term needs of the environment can be addressed, thereby enhancing sustainability and ensuring best use of our natural resources.

Most recently, the United Nations declared 2010 to be the International Year of Biodiversity. It is therefore apt that BMAPA has taken the opportunity to develop an over arching industry biodiversity action plan. This document presents the BMAPA Biodiversity Action Plan which it is hoped will more firmly establish consideration of biodiversity issues within the sustainable development strategy of the Association and provide marine aggregate producing companies with a practical and pragmatic operational management tool for the future.

2. Introduction and Statement of Intent

Management, maintenance and enhancement of biodiversity are central to current thinking regarding sustainable development and corporate social responsibility. Governments, communities and industry must all consider the implications of their actions on biodiversity to ensure that, where possible, adverse effects on biodiversity are minimised and opportunities for maintenance and enhancement are maximised. The UK marine aggregate industry is no exception. As part of the industry's continued drive towards improvements in operating practices, BMAPA aims to develop and maintain a biodiversity action plan (BAP). The aim of the BAP is to assist its members develop the most sustainable working practices, and improve the biodiversity management of the industry in general and of marine aggregate extraction sites around the UK.

BMAPA is the trade association for the marine aggregate industry in the UK, and a constituent body of the wider Mineral Products Association. It represents 11 members with a marine interest, who collectively in terms of resource production account for around 90% of the annual UK total. The licence areas operated by the British marine aggregate industry cover 1291km^2 of the UK continental shelf (as of the end of 2010) and by virtue of the regular surveys undertaken by members a vast amount of data describing the seabed habitats and marine species in the vicinity of the licence areas has been acquired. With this in mind, BMAPA feel it is essential that the information available to members is managed in such a way that the implications of marine aggregate extraction for marine biodiversity is suitably considered and operations are managed in a coherent and sustainable way. Indeed, one of BMAPAs core values states that:

"...we recognise the importance of marine biodiversity and the contribution we can make to better understanding and protection of marine species and habitats."

As an addition to BMAPAs existing Sustainable Development Strategy, it is intended that the BMAPA BAP will provide members with a structure when considering ongoing activities and proposals for new dredging areas. Together, these over-arching policies will provide BMAPA members with a framework to ensure that regulatory authorities and organisations responsible for biodiversity management in the UK receive suitable quality, relevant information, compatible and comparable with their own reporting initiatives.

As a result of this commitment, BMAPA have produced a Biodiversity Action Plan (BAP) strategy document and committed to the development of this BAP.

3. Aims, Objectives and Structure of the BAP

This BAP aim to:

- provide information on the area available for aggregate dredging on a regional basis
- provide information on the area in each region impacted by aggregate dredging activity
- provide a description of the habitats and species against which the significance of the impacts of dredging can be assessed
- guide work that seeks to improve understanding of the specific biotopes that exist in each region and improve knowledge of the impacts arising from aggregate extraction
- ensure dissemination of information on the regional environment to a wider audience in order to assist management of regional activities and improve public awareness
- where applicable, ensure that regional management is informed in order to conserve and enhance habitats, species diversity and local distinctiveness
- ensure that monitoring data is provided to statutory nature conservation bodies in support of their remit to comply with relevant nature conservation legislation and commitments.

In order to meet these aims, the following objectives have been set:

Objective 1 – Monitor dredging activities

- Provide annual, comparative metrics for the area available for dredging, the area dredged, dredging intensity and regional extraction tonnages.

Objective 2 – Geological and Bathymetric Features

- Provide a baseline description of key geological features that have been identified within the region and assess their vulnerability to aggregate dredging.
- Provide a baseline description of key bathymetric features that have been identified within the region and assess their vulnerability to aggregate dredging.

Objective 3 – Habitats and Species

- Characterise the key species and habitats that exist within the region against which the significance of the impacts of dredging can be assessed.
- Utilise monitoring data to assess the health of species in areas surrounding licence areas where secondary impacts may occur and the effect of extraction on species identified within the licence areas.
- Provide a comparison of baseline description of habitat with habitat status at cessation of dredging.
- Monitor the recovery of biotopes and associated species within licence areas following cessation of extraction activities wherever practicable as part of operators wider monitoring and resource management commitments.
- Produce region specific Habitat and Species Action Plans, in support of relevant UKBAP plans, and report and review annually the status of habitats and species in each region.
- Initiate, maintain and improve working practices and reporting to account for the requirements of the UKBAP, Habitats Directive and marine nature conservation in general and seek to develop links with groups undertaking similar monitoring survey work in the region for information exchange and collaboration where appropriate.
- Work to improve understanding of the specific biotopes that exist within the region and the nature and extent of expanded MNCR biotope classifications.
- Where necessary initiate dredging management practices that seek to preserve rare or unusual areas.

Objective 4 – Marine Protected Areas (MPAs)

- Maintain up to date regional charts of all relevant marine protected areas in relation to dredging areas.
- Maintain records of the features for which MPAs have been designated and the most up to date information regarding the condition of the MPAs.
- Provide commentary regarding the possible sensitivity of MPAs to impacts that may arise from marine aggregate extraction.

Objective 5 – Dissemination

- Disseminate environmental data to appropriate data custodians, stakeholders, wider public and regional management organisations.
- Raise awareness of the characteristic habitats, species and features of the region, their status and the nature of threats to their health.

4. Terms of reference

This section of the document identifies and describes relevant strategy, policy and planning documentation that has been used to inform this BAP.

4.1. International Conventions and National Polices & Guidelines

The UK became the first country to produce a national biodiversity action plan (BAP) in 1994, following the Convention on Biological Diversity in Rio de Janeiro. This originally contained a list of 59 broad species and habitats to conserve, and (where practicable) to enhance over the next 20 years. A steering group was also established to implement the UK BAP who identified a total of 1250 species and habitats of conservation concern. This list was endorsed by the UK Government in a document entitled 'Government Response to the UK Steering Group Report on Biodiversity' which included a progress report on the established targets.

The UK BAP species and habitats of most concern were termed 'priority species' and 'priority habitats'. 391 Species Action Plans (SAPs) and 45 Habitat Action Plans (HAPs) were selected from the initial list of species and habitats between 1995 and 1999, with an additional 104 Species Statements.

A revised UK BAP structure was implemented in late 2002 along with the UK Biodiversity Partnership Standing Committee (UKBPSC) to manage the business of the UK Biodiversity Partnership. Following the implementation of this new structure, a full review of the UK BAP was undertaken in 2005, resulting in revised targets for species and habitats in 2006. Following this, the UK BAP species and habitats were reviewed and published in 'Report on the Species and Habitat Review 2007' increasing the number of priority species to 1150, and the number of priority habitats to 65.

In August 2011, a new biodiversity strategy for England was published by Defra. Entitled 'Biodiversity 2020: A strategy for England's wildlife and ecosystem services', this built on the Natural Environment White Paper and UK National Ecosystem Assessment, both published earlier in the same year, and defines an ambitious biodiversity strategy for England for the next decade. Central to the success are four priority areas, namely; a more integrated large-scale approach to conservation on land and sea, putting people at the heart of biodiversity policy, reducing environmental pressures and improving knowledge.

The UK Marine Protected Area (MPA) Network, comprising international designations such as the Natura 2000 sites (SAC/SPA) and national Marine Conservation Zones (MCZ), are also important when considering BAPs. Where appropriate and complementary, the SAC/SPA and MCZ species or habitats protected will be referred to within the regional BAPs described in section 9. It is expected that the baseline review will draw from Defra-funded research commissioned to underpin the development of the UK MPA Network, such as projects MB102 and MB106. The various outputs from these provide comprehensive overview data on habitat and species distribution together with detailed analysis of feature sensitivity to various anthropogenic pressures.

4.2. BMAPA Strategy and Policy

BMAPA have produced a Sustainability Strategy and to date have produced a number of annual sustainable development reports. These documents place Biodiversity Action Plans high on the industry's agenda as the development of a BAP is objective number 2.

4.3. Industry Monitoring Data

Dredging licences often require regular monitoring to assess the impacts arising from the dredging activity. The monitoring occurs regularly and employs of a variety of techniques aimed at determining the sensitivities of habitats and species and the potential/actual impacts arising from extraction. Data from these surveys is provided to the regulator and often includes information regarding conservation features of interest and significance. This information can be used at a regional scale to inform of potential BAP features of interest and share best practice for the gathering, interpreting and reporting of such data.

4.4. Aggregate Association and Company BAPs

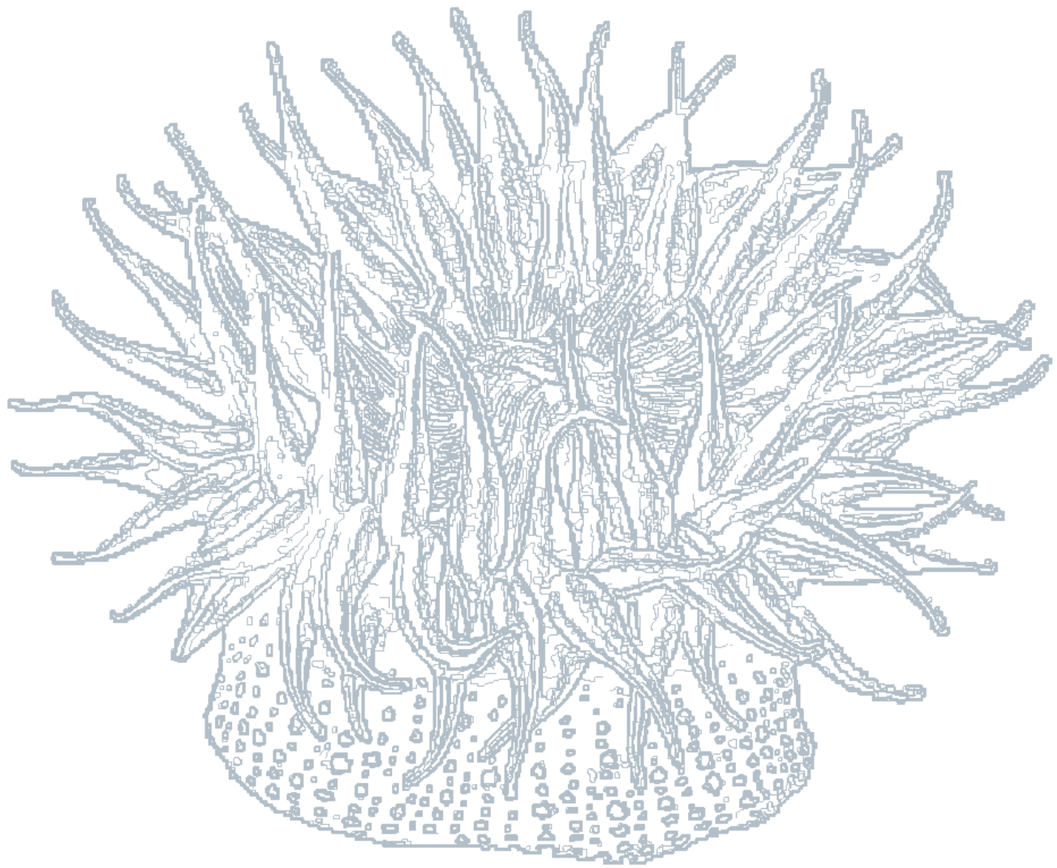
The marine aggregate industry in the Eastern English Channel operates as an association. The East Channel Association (ECA) has produced a BAP document for the region which can be seen at www.eastchannel.info. The ECA regularly monitors and reviews its activity, and the regional effects and impacts of dredging. This monitoring data provides a valuable resource for regulators and industry alike to inform management of their operations.

Additionally, individual companies may also produce BAP documents. It is known that Hanson Aggregates Marine Ltd currently have BAP documents for their most recently licensed areas they operate around the UK coastline.

4.5. Other Documents

In addition to the work carried out as detailed above, a number of other documents and programmes are also relevant here. Projects include the Regional Environmental Characterisation surveys (Funded through the Aggregate Levy Sustainability Fund) and the Marine Aggregate Regional Environmental Assessment programme undertaken by the aggregate industry. These data sets will be highly valuable to this BAP, in describing the baseline conditions of the regions in which they were undertaken.

In addition to the projects outlined above, The Crown Estate, BMAPA and members of the marine aggregate industry also conduct research to refine impact models and assessments. These studies may also be important within this BAP to understand the implications of dredging at sites where particular BAP species or habitats have been identified.



5. Positioning of the BAP within existing management structures

BMAPA is seeking to adopt a BAP that sits at the heart of its wider Sustainable Development reporting commitments, which draw on the outputs of other initiatives. The aim is to provide an overview of biodiversity issues in the context of marine aggregate extraction and a resource for member companies to inform their individual activities. Once implemented, the BAP will need to be linked to a variety of organisations and information sources to ensure that it is properly informed, that it remains current and that the outcomes of the BAP process helps to direct a range of activities.

As a consequence, this document is being developed with consideration of information from existing BMAPA initiatives to ensure that, where possible, the BAP enhances their utility and duplication of effort is avoided. Information from relevant national and international programmes of biodiversity management have been reviewed and summarised in the final Strategy document to ensure that the development of the BAP is suitably informed. By considering relevant information, the BAP will be suitable for members when assessing the potential impacts of their activities and managing operational extraction licences. BMAPA consider the following points important in generating a BAP for the aggregates industry:

i) A list of priority species and habitats, and marine protected areas (MPAs), requiring consideration during all licence applications. This will include species identified in national and regional designations including Annex 1 species and the section 42 list. For details of the MPAs currently under consideration, please see http://jncc.defra.gov.uk/page-4524.

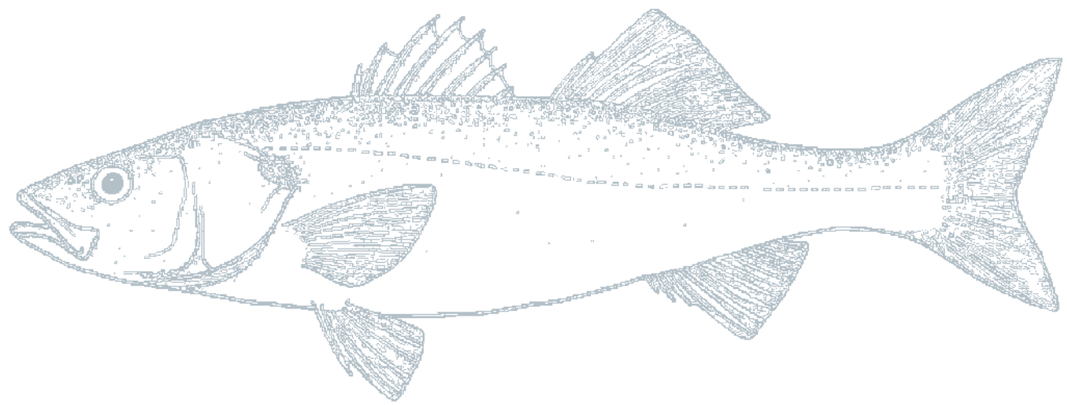
ii) Statements regarding the sensitivity of priority species (described above), habitats and MPAs to dredging impacts, drawing upon existing sensitivity/pressure/exposure vulnerability matrices.

iii) Standardised monitoring protocols and assessment criteria capable of describing biodiversity characteristics of sites targeted by the marine aggregate industry on a regional and national scale, benchmarked against measured impacts.

iv) A list of accepted mitigation measures that are applied when BAP species, habitats or MPAs are identified within an area influenced by aggregate extraction operations on a regional and national scale.

v) Case studies of regional monitoring work that highlights the role marine aggregate extraction plays in contributing to the UK BAP.

By pursuing this approach, it will be possible for companies to draw on the BAP to inform individual licence applications and direct the management of operational extraction sites. Additionally, the sharing of information relating to priority BAP habitats, species and survey good practice will help to enhance the contribution marine aggregate extraction is making to the wider marine community.



Biodiversity Action Plan (BAP) PLAN

6. The physical and biological effects of marine aggregate extraction

In order that relevant habitats and species are considered in the BAP, it is first necessary to describe in general terms the effects of marine aggregate extraction. The environmental effects of aggregate extraction have been extensively studied over the past two decades and there is now a clear understanding of the ways in which impacts develop, the scales they apply, their severity/significance and their longevity. These impacts are summarised below. In each case, links to references describing the background for development understanding of dredging effects and impacts are provided. This document, whilst it acknowledges that broader effects on biodiversity (both positive and negative) may result from marine aggregate extraction e.g. reduction in the need to target land based resources, this BAP only addresses the effects of dredging at a localised scale.

The effects of marine aggregate extraction can broadly be divided into two themes; physical effects and biological effects. In general terms, physical effects of dredging drive changes in the biological communities that are affected. The description of effects below provides the basis for understanding of these broad categories of effect.

Finally, it is worth noting that dredging effects may be either detrimental or beneficial to biodiversity over differing spatial and temporal scales. This is discussed later in the document along with a consideration of how dredging can be best managed in light of the biodiversity issues of a site.

6.1. Physical effects and potential impacts of dredging

Dredging results in effects on the physical environment in the vicinity of the activity. Effects on the seabed, the water column and hydrodynamic processes result from the extraction of resource sediment and the return of unwanted, fine sediment back into the sea. The ways in which dredging affects the physical environment are summarised in the following tables along with information describing impact, possible mitigation measures, a consideration of certainty of understanding and a brief statement describing possible future action to address the issues discussed.

Seabed removal – changes to sediment character	
Aggregate extraction involves removal of the surface of the seabed. Suction dredging, whether undertaken statically or whilst trailing the dredge gear, removes the upper layers of the seabed sediment and exposes the sediment below. This may result in changes to the physical characteristics of the seabed sediment following dredging if all of the sediment deposit targeted for extraction is removed.	
Possible impacts – If unmanaged, there may be a significant change in the type of seabed sediment following dredging, and hence the habitat available for recolonisation. Impacts of this type have traditionally been considered negative due to a perception that the effect represents a loss of habitat, however in reality such an effect represents a change in habitat and as such it is possible that the resulting habitat will have an enhanced biodiversity value to that which existed prior to dredging.	**Mitigation** – Regular resource surveys are undertaken to ensure that a layer of sediment similar to that which existed prior to dredging remains following dredging. In this way, the industry ensures that the foundation habitat available for recolonisation is comparable to that which existed prior to extraction operations.
Certainty of understanding – Good with respect to potential negative effects on biodiversity. Poor with respect to potential positive effects.	**Possible future action** – Develop better understanding of how a change in seabed sediment character, or change in the number/variety of habitats present at a location might positively effect biodiversity.

Seabed removal – changes to bathymetry	
Marine aggregate extraction results in an increase in water depth in the area from which resources are removed. Additionally, release and deposition of fine sediment onto the seabed as a result dredging activities can result in shallower water depths surrounding the dredging area. Changes in water depths can have an effect on the hydrodynamic processes that influence a site. Tidal currents and wave propagation can both be influenced by such changes and this in turn can influence the types of habitats that exist on the seabed and their associated faunal communities.	
Possible impacts – Removal of resources from the seabed results in an increase in water depth. Such depth increases are proportionally small and are unlikely to influence the types of animals that inhabit an area, however the changes in water depth can affect wave and tidal processes. In general terms, the nature of such changes is small and unlikely to affect broadscale biodiversity however highly localised changes may result. Effects include increases and decreases in bed shear stress that can result in changes to sediment mobility and scour. This can result in changes in the biological community structure whereby animals not adapted to changed conditions will not inhabit the area.	**Mitigation** – Before dredging is permitted, an applicant must assess the likely effects of dredging plans in terms of the area affected by, and percentage change in, tidal current velocity and wave propagation parameters. This allows a high level assessment of significance of changes to be made at the outset of the development. If changes to tide and wave conditions are shown to be considerable by modelling studies then restrictions on the volume of resources can be imposed to prevent over-deepening of the dredging area.
Certainty of understanding – Moderate with respect to potential negative effects on biodiversity. Poor with respect to potential positive effects.	**Possible future action** – Develop better understanding of how a significant change in waves and tides might negatively and positively effect biodiversity.

Plume – changes to seabed sediment character	
Dredging marine aggregate results in a fine sediment plume in the water column where activities occur. This plume disperses under the influence of gravity and tidal currents with the constituent sediment being transported away from the location of dredging or deposited on the seabed within and surrounding the dredging area. Deposition of plume sediment onto the seabed can change the character of the seabed sediment and change the habitat character.	
Possible impacts – Plume sediment is formed predominantly of fine sediment (sand and silt). When released during the dredging process this sediment disperses and settles back to the seabed. Over time, significant deposits of fine sediment may accumulate and in such cases the seabed habitat may be altered to such an extent that the associated faunal communities change. Impacts may include smothering of individuals, increased stress on filter feeders resulting in lowered reproductive success and mortality, or detrimental effects on spawning grounds through accumulation of fine sediment deposits. Conversely, there is the possibility that some species may benefit from the increase in mobile sediment and the greater variability in seabed character resulting from addition of mobile sediment.	**Mitigation** – Minimisation of screening during dredging operations will reduce the intensity of the plume and the volume of sediment remobilised during a single dredging event. In addition, only dredging at certain states of the tide, and in certain orientations, may also prevent the plume from transiting across sensitive sites.
Certainty of understanding – Good with respect to potential negative biodiversity effects. Poor with respect to potential positive biodiversity effects.	**Possible future action** – Develop better understanding of how plumes and suspended sediment might negatively and positively effect biodiversity.

Biodiversity Action Plan (BAP) PLAN

Noise and vibration	
Dredging results in emission of noise into the environment. This noise may cause disturbance to animals that inhabit dredging areas and their immediate surroundings. Minor disturbance effects may also occur during a dredger's transit to and from a dredging area. The factors affecting the level of disturbance include the type and size of vessel undertaking the dredging, the nature of resources being dredged and the sensitivity of animals to noise.	
Possible impacts – Sensitivity to noise and vibration varies between species. Whilst some species might be tolerant of disturbance the behaviour of other species might be significantly modified due to the presence of a dredging vessel. Impacts due to noise and vibration from dredging operations include avoidance behaviour, which can influence feeding/breeding success, physical damage, which can subsequently influence an individual's survival, and in extreme cases mortality.	**Mitigation** – Reduction of loading times and minimisation of screening activities to ensure that noise effects are minimised where practicable. Also the reduction of steaming times and investment in maintenance of the dredging fleet.
Certainty of understanding – Good with respect to potential negative effects. No beneficial effects.	**Possible future action** – Develop better understanding of the sensitivity of species to dredging noise and the significance of noise effects.

Plume – changes in suspended sediment concentration	
During and immediately following dredging a plume of sediment is generated around the dredger. The suspended sediment concentration of the plume is inversely proportional to the distance from the dredger i.e. lower concentrations occur at greater distances from the dredger. Suspended sediment in the water column may affect fish, bird and mammal species that inhabit the area resulting in avoidance behaviour whilst the plume exists. Under normal conditions the plume will disperse relatively quickly (over a period of 3-6 hours) after which suspended sediment concentrations return to near natural levels.	
Possible impacts – Plume sediment, whilst in suspension, has the potential to cause displacement effects on a number of species. This displacement can hinder feeding, breeding and spawning behaviour and in extreme cases may lead to mortality if disturbance occurs over prolonged periods. The suspension of sediment and biological material in the plume may serve as a food source for some species of fish and filter feeders.	**Mitigation** – Limitations placed on aggregate extraction companies ensure that plumes occur for a restricted periods over defined areas. Where specific sensitivities are identified, restrictions on screening activity may be employed and in some cases seasonal dredging restrictions.
Certainty of understanding – Good with respect to potential negative effects. Poor with respect to potential positive effects.	**Possible future action** – Develop better understanding of how a significant change in seabed sediment might positively effect biodiversity.

6.2. Biological effects of dredging

Generally speaking, the biological effects of dredging occur in response to the physical effects described above. The faunal communities that exist on the seabed and in the water column are influenced by the changes to the physical environment resulting from dredging. The ways in which biological communities may be affected by dredging are summarised in the following tables along with information describing impact, possible mitigation measures, a consideration of certainty of understanding and a brief statement describing possible future action to address the issues discussed.

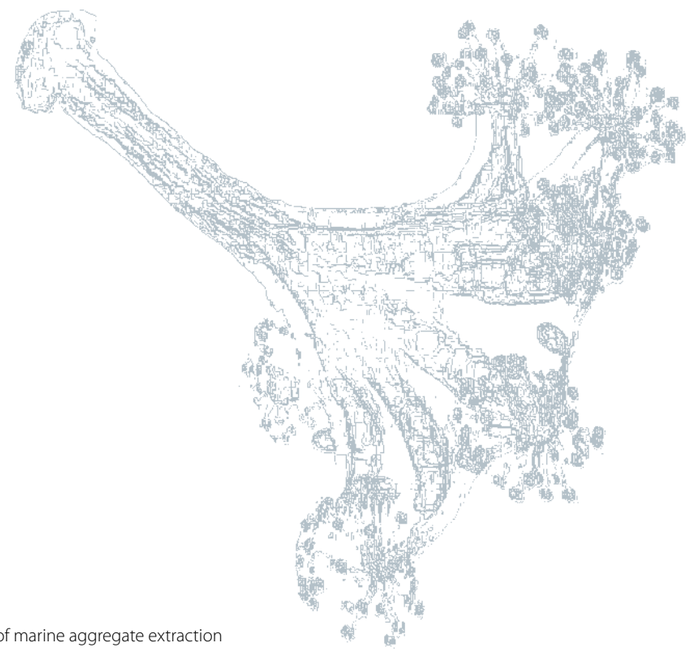
Reduction in numbers of species, numbers of individuals, species diversity and biomass	
Following removal of the upper layers of seabed sediment during dredging, numbers of species, numbers of individuals, species diversity and biomass may be reduced. Whilst this may be the case on a localised scale, it may not be true over a wider area – an important consideration when determining the effects of dredging on biodiversity.	
Possible impacts – The removal of species from the seabed has obvious implications for the wider community. Not only is there a reduction in prey items available for the wider ecosystem, but the communities that existed may be entirely removed or temporarily modified.	**Mitigation** – Monitoring of the communities that existed before, during and after dredging will identify the effects of dredging. Furthermore, the requirement to leave behind sediment similar to that which existed prior to dredging should ensure that the area has the same potential to support the habitats and species that existed prior to dredging.
Certainty of understanding – Good with respect to negative effects.	**Possible future action** – Develop a better understanding of how changes in benthic communities might affect the wider ecosystem and biodiversity.

Reduction in prey items for fish and shellfish	
The reduction in species, biomass, species diversity and number of individuals may have a detrimental, knock on effect to the species that usually prey on these lower levels of the food chain. Therefore, whilst the localised dredging may only remove communities from the direct footprint of dredging, the effects of this may have implications for the wider ecosystem and commercial fisheries.	
Possible impacts – As a result of dredging, the removal of species from the seabed may have a knock on effect in reducing prey items available for the wider ecosystem.	**Mitigation** – Monitoring of the wider marine communities including, reference areas, the wider ecosystem and food chain.
Certainty of understanding – Good with respect to negative effects.	**Possible future action** – Develop a better understanding of how changes in fish and shellfish communities might affect the wider ecosystem and biodiversity.

Reduction in spawning and nursery grounds	
Many marine species require certain habitat types to spawn, or as nursery areas. As aggregate extraction generally targets thick deposits of sand and gravel in certain water depths from 12-50m, there is a potential to affect the area of total available spawning and nursery habitat for a range of species.	
Possible impacts – The removal and/or disturbance of the seabed of a certain character can impact upon the preferred spawning and/or nursery grounds for certain marine species. Additionally, secondary deposition arising from aggregate extraction may result in the deposition of fine sediment (sand/silt) across wider areas of suitable habitat.	**Mitigation** – The requirement to leave sediment of a similar quality to that which existed before dredging will allow for the area to offer the same or similar habitat for spawning and nursery as existed prior to dredging. Seasonal and screening restrictions may also provide mitigation.
Certainty of understanding – Good with respect to impacts upon the wider regional habitats and nursery/spawning areas defined by Cefas.	**Possible future action** – Improve understanding of the significance of effects on spawning and nursery areas, and assess the validity of operational restrictions in mitigating the effects.

Effects on marine mammals, birds and elasmobranchs	
Dredgers produce noise and fine suspended sediment, both of which can potentially affect marine mammals, birds and elasmobranchs. Additionally, changes in the nature of benthic communities and increases in suspended sediment may result in a reduction in feeding success.	
Possible impacts – Dredger produce noise over a range of frequencies. Additionally, fine sediment is released during the dredging process and this can potentially affect marine mammals, birds and elasmobranchs. Changes in the nature of benthic communities may also have negative effects on these groups.	**Mitigation** – There are relatively low sightings of both marine mammals and basking sharks within most aggregate producing regions. Therefore, it is unlikely that there will be any overlap or impacts, and as a result, no mitigation is utilised specifically for marine mammals and elasmobranchs. Some species of bird do use the marine space within regions where aggregate extraction occurs. To date, the impacts on birds have not been considered significant and no specific mitigation measures have been employed.
Certainty of understanding – Noise studies have been undertaken in most aggregate producing regions to characterise the noise arising from aggregate extraction. The increases in suspended sediment concentration arising from aggregate extraction are also well known. Changes in the character of seabed sediment and benthic communities are well undertood.	**Possible future action** – Develop a better understanding of how noise, changes to benthic communities and suspended sediment concentration affects marine mammals, birds and elasmobranchs.

Effects on features of nature conservation interest/significance	
Features of nature conservation interest/significance can be found in many forms and occur in a variety of water depths and hydrodynamic environments. These features can be affected by dredging both directly (through their removal or disturbance) or indirectly (through the transit of the sediment plume across them).	
Possible impacts – Aggregate extraction can potentially remove features from within the direct footprint of dredging, or disturb and disperse them. Additionally, the sediment plume arising from aggregate extraction may affect the features identified.	**Mitigation** – Monitoring of the features before, during and after dredging, and exclusion of identified features from extraction activities.
Certainty of understanding – Good to poor. Some features are well mapped and understood, whilst others are less well understood and sensitivities and recoverability unknown.	**Possible future action** – Develop a better understanding of the spatial extent of features, the nature and significance of effects of aggregate extraction upon them and their sensitivity and recoverability.



7. Identification of the priority species and habitats for consideration in the BAP

The purpose of a BAP is to 'conserve and enhance' biodiversity. Whilst this over-arching aim is the foundation of the plan, the BAP will be more clearly directed through identification of priority species and habitats. In this way, the resources required for monitoring and reporting can be better focused on the components of the overall ecosystem that are most sensitive to the influence of aggregate extraction. This phase of the BAP development will be informed by European and domestic legislation with respect to protected species and habitats, national BAP guidance, relevant research regarding the sensitivity of marine organisms to the effect of dredging, and aggregate industry data regarding the types of species and habitats that are most likely to be found in the vicinity of aggregate extraction sites. It is also expected that wider data sources will be used, such as national research projects in support of the wider UK MPA network, the National Biodiversity Network Gateway and local record centres and BAP administrators.

Marine aggregate extraction, by virtue of the fact that the industry targets specific sediment types, affects the habitats formed by such sediments and the animals they support. Regionally, the types of resources targeted for extraction differ. In the Irish Sea, Bristol Channel and Severn Estuary companies tend to target sand sediment. In the Eastern English Channel, Thames Estuary and Anglian Offshore regions resources are more likely to be fluvially derived gravel and sand. In the Humber region extraction operations tend to focus on glacio-fluvial sediment deposits of gravel and sand.

In addition to the nature of the sediment targeted for extraction, the present day hydrodynamic conditions will have an influence on the types of animals that typically inhabit areas of interest to the marine aggregate industry. Similarly, the type and mobility of naturally occurring seabed sediment will dictate the types of animals that inhabit an area of seabed. Due to these and other factors, habitats and the species that inhabit them will vary from region to region and from licence area to licence area. It is therefore important for the BAP to provide a sound basic description of typical habitats and their associated faunal communities in order for useful aims, supporting activities and actions to be defined later in the process.

7.1. Priority habitats and species

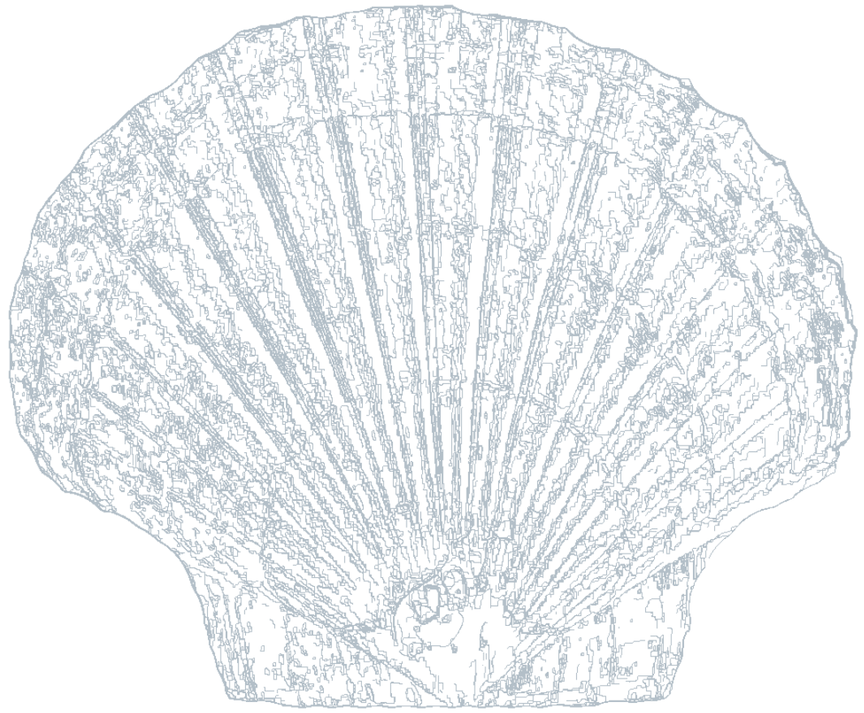
Using the understanding of the nature of impacts arising from dredging, a list of priority habitats and species has been drawn up that may be affected. The list has been developed using references provided by the statutory nature conservation advisors and provides a comprehensive list of the most important habitats and species in terms of their conservation value and/or protection status.

The most recent list of priority habitats and species was updated in 2007 following review. The full list is published below, but as many species and habitats listed are unlikely to be relevant to marine aggregate extraction, the list highlights those habitats and species that are thought to be irrelevant to marine aggregate dredging in UK waters. Habitats and species were considered based on their geographical distribution, exposure pathways, life characteristics and expert judgement. The baseline BAP documents to be generated for each dredging region will provide a definitive listing, based on known species/habitat distribution and their interaction with marine aggregate operations:

Taxon	Scientific name	Common name	* = Unlikely to be affected by marine aggregate extraction
alga	*Anotrichium barbatum*	Bearded Red Seaweed	*
	Ascophyllum nodosum ecad *mackaii*	Wig Wrack or Sea-loch Egg Wrack	*
	Cruoria cruoriaeformis	Burgundy maerl paint weed	*
	Dermocorynus montagnei	-	*
	Lithothamnion corallioides	Coral Maërl	*
	Padina pavonica	Peacock's tail	
	Phymatolithon calcareum	Common Maërl	

Taxon	Scientific name	Common name	* = Unlikely to be affected by marine aggregate extraction
bird	*Aythya marila*	Greater Scaup	
	Gavia arctica	Black-throated Diver	
	Larus argentatus subsp. argenteus	Herring Gull	
	Melanitta nigra	Common Scoter	
	Puffinus mauretanicus	Balearic Shearwater	
	Sterna dougallii	Roseate Tern	
bony fish	*Ammodytes marinus*	Lesser Sandeel	
	Aphanopus carbo	Black Scabbardfish	*
	Clupea harengus	Herring	
	Coryphaenoides rupestris	Roundnose Grenadier	*
	Gadus morhua	Cod	
	Hippocampus guttulatus	Long-snouted Seahorse	
	Hippocampus hippocampus	Short-snouted Seahorse	
	Hippoglossus hippoglossus	Atlantic Halibut	
	Hoplostethus atlanticus	Orange Roughy	*
	Lophius piscatorius	Sea Monkfish	
	Merlangius merlangus	Whiting	
	Merluccius merluccius	European Hake	
	Micromesistius poutassou	Blue Whiting	
	Molva dypterygia	Blue Ling	*
	Molva molva	Ling	
	Pleuronectes platessa	Plaice	
	Reinhardtius hippoglossoides	Greenland Halibut	*
	Scomber scombrus	Mackerel	
	Solea solea	Sole	
	Thunnus thynnus	Blue-fin Tuna	
	Trachurus trachurus	Horse Mackerel	

Taxon	Scientific name	Common name	* = Unlikely to be affected by marine aggregate extraction
cnidarian	*Amphianthus dohrnii*	Sea-fan Anemone	*
	Arachnanthus sarsi	Scarce Tube-dwelling Anemone	
	Edwardsia timida	Timid Burrowing Anemone	*
	Eunicella verrucosa	Pink Sea-fan	*
	Haliclystus auricula	Kaleidoscope jellyfish	*
	Leptopsammia pruvoti	Sunset Cup Coral	*
	Lucernariopsis campanulata	Stalked jellyfish	*
	Lucernariopsis cruxmelitensis	St John's jellyfish	*
	Pachycerianthus multiplicatus	Fireworks Anemone	
	Pachycordyle navis	Brackish Hydroid	*
	Swiftia pallida	Northern Sea Fan	*
	Arrhis phyllonyx	-	*
crustacean	*Mitella pollicipes*	Gooseneck Barnacle	*
	Palinurus elephas	Crayfish, Crawfish or Spiny Lobster	
mollusc	*Atrina fragilis*	Fan Mussel	
	Ostrea edulis	Native Oyster	
	Tenellia adspersa	Lagoon Sea Slug	*



Taxon	Scientific name	Common name	* = Unlikely to be affected by marine aggregate extraction
cetacean	*Balaenoptera acutorostrata*	Minke Whale	
	Balaenoptera borealis	Sei Whale	*
	Balaenoptera musculus	Blue Whale	*
	Balaenoptera physalus	Fin Whale	*
	Delphinus delphis	Common Dolphin	
	Eubalaena glacialis	Northern Right Whale	*
	Globicephala melas	Long-finned Pilot Whale	
	Grampus griseus	Risso's Dolphin	
	Lagenorhynchus acutus	Atlantic White-sided Dolphin	
	Lagenorhynchus albirostris	White-beaked Dolphin	
	Megaptera novaeangliae	Humpback Whale	*
	Mesoplodon bidens	Sowerby's Beaked Whale	*
	Mesoplodon mirus	True's Beaked Whale	*
	Orcinus orca	Killer Whale	
	Phoca vitulina	Common Seal	
	Phocoena phocoena	Harbour Porpoise	
	Physeter catodon	Sperm Whale	*
	Stenella coeruleoalba	Striped Dolphin	
	Tursiops truncatus	Bottle-nosed Dolphin	
	Ziphius cavirostris	Cuvier's Beaked Whale	*
shark/skate/ray	*Centrophorus granulosus*	Gulper Shark	*
	Centrophorus squamosus	Leafscraper Shark	*
	Centroscymnus coelolepsis	Portuguese Dogfish	*
	Cetorhinus maximus	Basking Shark	
	Dalatias licha	Kitefin Shark	*
	Dipturus batis	Common Skate	
	Galeorhinus galeus	Tope Shark	
	Isurus oxyrinchus	Shortfin Mako	
	Lamna nasus	Porbeagle Shark	
	Leucoraja circularis	Sandy Ray	
	Prionace glauca	Blue Shark	
	Raja undulata	Undulate Ray	
	Rostroraja alba	White or Bottlenosed Skate	
	Squalus acanthias	Spiny Dogfish	
	Squatina squatina	Angel Shark	
tunicate	*Styela gelatinosa*	Loch Goil Sea Squirt	*
turtle	*Caretta caretta*	Loggerhead Turtle	
	Dermochelys coriacea	Leatherback Turtle	

In addition, the following habitats are also identified within the UK BAP:

UK BAP Broad Habitat	UK BAP Priority Habitat	* = Unlikely to be affected by marine aggregate extraction
Supralittoral Rock	Maritime Cliff and Slopes	*
Supralittoral Sediment	Coastal Vegetated Shingle	
	Coastal Sand Dunes	
Littoral Rock	Intertidal Chalk	
	Intertidal Underboulder Communities	
	Sabellaria alveolata reefs	

UK BAP Broad Habitat	UK BAP Priority Habitat	* = Unlikely to be affected by marine aggregate extraction
Littoral Sediment	Coastal Saltmarsh	
	Intertidal Mudflats	
	Seagrass Beds	
	Sheltered Muddy Gravels	
	Peat and Clay Exposures	
Sublittoral Rock	Subtidal Chalk	
	Tide-Swept Channels	*
	Fragile Sponge and Anthozoan Communities on Subtidal Rocky Habitats	
	Estuarine Rocky Habitats	*
	Seamount Communities	*
	Carbonate Mounds	*
	Cold-water Coral Reefs	*
	Deep-Sea Sponge Communities	*
	Sabellaria spinulosa Reefs	
Sublittoral Sediment	Subtidal Sands and Gravels	
	Horse Mussel Beds	
	Mud Habitats in Deep Water	
	File Shell Beds	*
	Maerl Beds	
	Serpulid Reefs	*
	Blue Mussel Beds on Sediment	
	Saline Lagoons	*

In addition to these species and habitats listed by the UK BAP, the Marine Conservation Zone project identified the following additional broadscale habitats and features of conservation interest (FOCI):

FOCI Species:

Scientific name	Common name	* = Unlikely to be affected by marine aggregate extraction
Gitanopsis bispinosa	Amphipod shrimp	
Cruoria cruoriaeformis	Burgundy maerl paint weed	*
Phymatolithon calcareum	Common maerl	
Lithothamnion corallioides	Coral maerl	*
Gobius couchi	Couch's goby	
Caecum armoricum	Defolin's lagoon snail	*
Anguilla anguilla	European eel	
Atrina pectinata	Fan mussel	
Gobius cobitis	Giant goby	
Pollicipes pollicipes	Gooseneck barnacle	*
Grateloupia montagnei	Grateloup's little-lobed weed	
Haliclystus auricula	Kaleidoscope jellyfish	*
Gammarus insensibilis	Lagoon sand shrimp	*
Armandia cirrhosa	Lagoon sand worm	*
Tenellia adspersa	Lagoon sea slug	*
Hippocampus guttulatus	Long snouted seahorse	
Lucernariopsis campanulata	Stalked jellyfish	*
Lucernariopsis cruxmelitensis	St John's jellyfish	*
Ostrea edulis	Native oyster	
Arctica islandica	Ocean quahog	
Padina pavonica	Peacock's tail	
Eunicella verrucosa	Pink sea-fan	*
Amphianthus dohrnii	Sea-fan anemone	*
Paludinella littorina	Sea snail	*
Hippocampus hippocampus	Short snouted seahorse	
Osmerus eperlanus	Smelt	
Palinurus elephas	Spiny lobster	
Nematostella vectensis	Starlet sea anemone	*
Leptopsammia pruvoti	Sunset Cup Coral	*
Alkmaria romijni	Tentacled lagoon-worm	*
Victorella pavida	Trembling sea mat	*
Raja undulata	Undulate ray	

FOCI Habitats:

Habitat name	* = Unlikely to be affected by marine aggregate extraction
Blue mussel beds	
Cold-water coral reefs	*
Coral gardens	*
Deep-sea sponge aggregations	*
Estuarine rocky habitats	*
File shell beds	*
Fragile sponge and anthozoan communities on subtidal rocky habitats	
Honeycomb worm reefs	
Horse mussel beds	
Intertidal underboulder communities	
Littoral chalk communities	
Maerl beds	
Mud habitats in deep water	
Native oyster beds	
Peat and clay exposures	
Ross worm reefs	
Sea pen and burrowing megafauna communities	
Seagrass beds	
Sheltered muddy gravels	
Subtidal chalk	
Subtidal sands and gravels	
Tide-swept channels	*

Broadscale Habitats:

Habitat name	* = Unlikely to be affected by marine aggregate extraction
Coastal saltmarshes and saline reedbeds	
Deep-sea bed	*
High energy circalittoral rock	
High energy infralittoral rock	
High energy intertidal rock	
Intertidal biogenic reefs	
Intertidal coarse sediment	
Intertidal mixed sediments	
Intertidal mud	
Intertidal sand and muddy sand	
Intertidal sediments dominated by aquatic angiosperms – Eelgrass beds and pioneer saltmarshes	
Low energy circalittoral rock	
Low energy infralittoral rock	
Low energy intertidal rock	
Moderate energy circalittoral rock	
Moderate energy infralittoral rock	
Moderate energy intertidal rock	
Subtidal biogenic reefs on sediment	
Subtidal coarse sediment	
Subtidal macrophyte-dominated sediment	
Subtidal mixed sediments	
Subtidal mud	
Subtidal sand	

Geological FOCI have not yet been generated by the MCZ process, however, it is envisaged that as these become available, they will be incorporated into the BMAPA regional BAPs where appropriate.

Further species and habitats are defined for conservation under Natura 2000. The relevant habitats not yet captured through the details above are listed below:

Habitat name	Explanation	* = Unlikely to be affected by marine aggregate extraction
Marine, coastal and halophytic habitats	Sandbanks which are slightly covered by sea water all the time	
	Estuaries	
	Mudflats and sandflats not covered by seawater at low tide	
	Coastal lagoons	
	Large shallow inlets and bays	
	Reefs	
	Submarine structures made by leaking gases	*
	Annual vegetation of drift lines	
	Perennial vegetation of stony banks	
	Vegetated sea cliffs of the Atlantic and Baltic coasts	
	Salicornia and other annuals colonising mud and sand	
	Spartina swards *(Spartinion maritimae)*	
	Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)*	
	Mediterranean and thermo-Atlantic halophilous scrubs *(Sarcocornetea fruticosi)*	
Coastal sand dunes and continental dunes	Embryonic shifting dunes	
	Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')	
	Fixed dunes with herbaceous vegetation ('grey dunes')	
	Atlantic decalcified fixed dunes *(Calluno-Ulicetea)*	
	Dunes with *Hippophae rhamnoides*	
	Dunes with *Salix repens ssp. argentea (Salicion arenariae)*	
	Humid dune slacks	
Rocky habitats and caves	Submerged or partially submerged sea caves	

Whilst many of these appear to be duplicated from the BAP list, the reason for their appearance on each list and the associated actions required may be different. Each BAP document will therefore highlight each action for each species required by each conservation designation listed above.

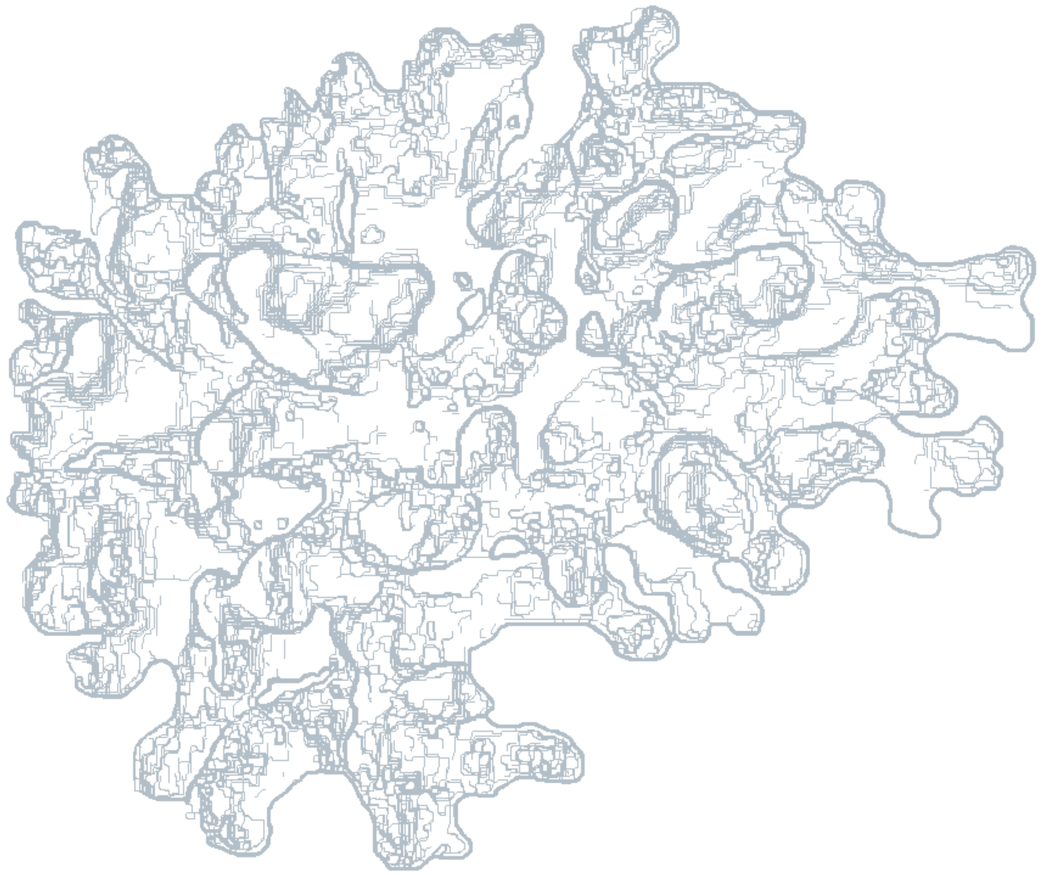
It is also important to incorporate the methodologies used during the identification of MCZs. As well as incorporating the rarity and sensitivity of habitats and species, the guidance issued in support of the selection of MCZ sites, identified evidence to allow the sensitivity of features to a wide range of pressures to be determined. In turn this allows their exposure to pressures associated with anthropogenic activity to be assessed in order to determine features vulnerability. This vulnerability assessment methodology will be used within the BAP documents to determine the pressure placed on the habitat or species by aggregate dredging.

8. Definition of broadscale aims, supporting activities and actions

Based on the priority species and habitats listed in 7.1, the following section provides initial aims, proposed supporting activities and the actions that will be used to monitor progress along with common mitigation measures for marine aggregate extraction. These will be specific, measureable, achievable, relevant and time-bound (SMART) to allow them to be compared and monitored. The timescales attached to actions are guidelines only and may not be achieved within the period proposed. In this event, reporting and review will be undertaken to monitor progress and direct future iterations of the BAP. Furthermore, as the BAP process evolves, the initial aims, supporting activities and actions defined may need to be adapted. In this respect, it is expected the delivery process will by necessity evolve over time as experience and knowledge develop.

For the purposes of this BAP, the broadscale aims, supporting activities and actions are identified at Taxon and Broad Habitat scale initially. These are expanded upon within section 9 where regional variations can take account of the specific habitats and species commonly occurring within these areas.

Wherever possible, actions have been linked to the BMAPA Sustainable Development report objectives. These are expanded upon later in this document, in support of the definition of regional-scale aims, supporting activities and actions.



Taxon	Aim	Supporting Activities	Action
alga	No significant adverse affect on algal species listed within the UK BAP during the extraction of aggregates from the marine environment.	Minimise the area dredged and therefore influenced by plume activities.	Minimise the spatial footprint of dredging operations through responsible and effective management.
		Minimise screening activities wherever practicable to minimise turbidity and suspended sediment within the water column.	Minimise the screening activity in the production process.
bird	No significant adverse affect on bird species identified within the UK BAP through the dredging or transportation of marine aggregate.	Ensure that dredging vessels navigate within marked shipping lanes wherever practicable.	Minimise the spatial footprint of dredging operations through responsible and effective management.
		Minimise the effects of dredging on prey items for the species listed in the UK BAP.	Minimise the screening activity in the production process.
		Gain a better understanding of the potential interactions of bird populations with marine aggregate extraction through the review of published literature on the occurrence of bird species identified within the UK BAP and assess the potential impacts of aggregate operations on bird populations and behaviour.	Where overlaps exist, minimise the spatial footprint of dredging operations through responsible and effective management.
bony fish	No significant adverse affect on populations and life cycles of bony fish species identified by the UK BAP during the extraction of marine aggregates.	Minimise the direct impact of dredging activities on bony fish identified by the UK BAP.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
		Minimise the impact of dredging activities on potential bony fish spawning sites identified by the UK BAP.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
		Map impact areas and potential spawning habitats from available data and ensure that regional spawning grounds for identified fish species are not adversely affected by marine aggregate extraction.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
cnidarian	No significant adverse affect on populations and life cycles of cnidarian identified by the UK BAP during the extraction of marine aggregates.	Map the extent of regional populations of cnidarian species identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on cnidarian populations and life cycle.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.

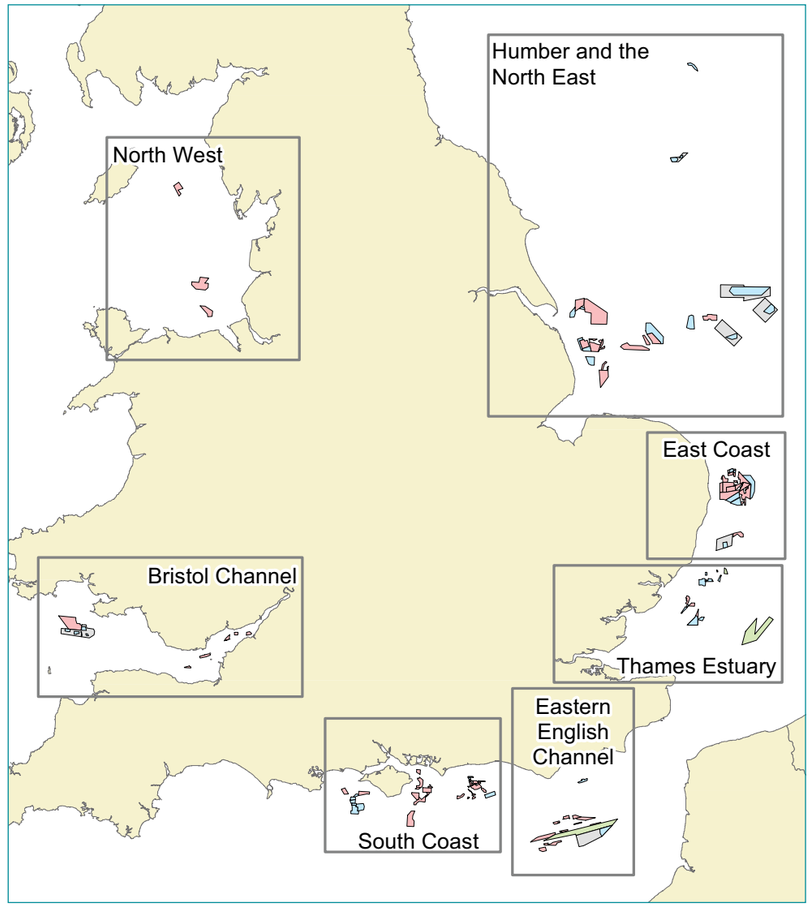
Taxon	Aim	Supporting Activities	Action
crustacean	No significant adverse affect on populations and life cycles of crustacean identified by the UK BAP during the extraction of marine aggregates.	Map the extent of regional populations of crustacean species identified by the UK BAP from available data sources and where overlaps exist, minimise the effects of marine aggregate extraction on crustacean populations and life cycle.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
mollusc	No significant adverse affect on populations and life cycles of mollusc identified by the UK BAP during the extraction of marine aggregates.	Map the extent of regional populations of mollusc species identified by the UK BAP from available data sources and where overlaps exist, minimise the effects of marine aggregate extraction on mollusc populations and life cycle.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
sea mammal	No significant adverse affect on marine mammals inhabiting or transiting the aggregate producing regions.	Minimise the noise footprint of aggregate dredgers above known background levels and avoid direct contact.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
			Report the occurrence of marine mammals using the SeaWatch reporting forms.
shark/skate/ray	No significant adverse affect on populations and life cycles of sharks, skate and rays identified by the UK BAP during the extraction of marine aggregates.	Map the extent of regional populations of sharks, skate and rays species identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on shark, skate and ray populations and life cycle.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
tunicate	No significant adverse affect on populations and life cycles of tunicate identified by the UK BAP during the extraction of marine aggregates.	Map the extent of regional populations of tunicate species identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on tunicate populations and life cycle.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
turtle	No significant adverse affect on turtles inhabiting or transiting the aggregate producing regions.	Minimise the noise footprint of aggregate dredgers above known background levels and avoid direct contact.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
			Report the occurrence of turtles using the SeaWatch reporting forms.

Broad Habitat	Aim	Supporting Activities	Action
Supralittoral Rock	No significant adverse affect on superlittoral rock habitats identified by the UK BAP during the extraction of marine aggregates.	Map the extent of the superlittoral rock habitats identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on these habitats.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
Supralittoral Sediment	No significant adverse affect on superlittoral sediment habitats identified by the UK BAP during the extraction of marine aggregates.	Map the extent of the superlittoral sediment habitats identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on these habitats.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
Littoral Rock	No significant adverse affect on littoral rock habitats identified by the UK BAP during the extraction of marine aggregates.	Map the extent of the littoral rock habitats identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on these habitats.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
Littoral Sediment	No significant adverse affect on littoral sediment habitats identified by the UK BAP during the extraction of marine aggregates.	Map the extent of regional littoral sediment habitats identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on these habitats.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
Sublittoral Rock	No significant adverse affect on sublittoral rock habitats identified by the UK BAP during the extraction of marine aggregates.	Map the extent of the sublittoral rock habitats identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on these habitats.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.
Sublittoral Sediment	No significant adverse affect on sublittoral sediment habitats identified by the UK BAP during the extraction of marine aggregates.	Map the extent of the sublittoral sediment habitats identified by the UK BAP from available data sources and minimise the effects of marine aggregate extraction on these habitats.	Minimise the spatial footprint of dredging operations through responsible and effective management and minimise the screening activity in the production process.

9. Definition of regional-scale aims, supporting activities and actions

The high level aims, supporting activities and actions identified in section 8 present the overall BAP for BMAPA for the UK as a whole. However, given the regional variations in habitats, species, MPAs and dredging activity, it is important to ensure that these aims, supporting activities and actions become more specific for each of the well defined geographic regions in which the industry operates. In this way, the regional BAPs will target specific features, sites, habitats and species identified by the UKBAP and other initiatives, relevant to the region and potentially adversely affected by aggregate extraction.

However, as this document sets out the strategy for the baseline BAP, a considerable amount of data collection and analysis is required to assess which UK BAP habitats and species exist within each of the distinct aggregate producing regions as defined below. It is anticipated that aggregate industry data regarding the types of species and habitats that are most likely to be found in the vicinity of regional aggregate extraction will be used. However, it is recognised that wider data sources will also be available to help refine the regional focus, such as national research projects in support of the wider UK MPA network, the National Biodiversity Network Gateway and local record centres and BAP administrators.



Therefore, in this document the aims, supporting activities and actions are highlighted for the first BMAPA BAP document which includes a literature review to capture the specific sites, features, species and habitats at risk from aggregate extraction. However, as research and monitoring data is received and reviewed by future BMAPA BAPs, the specific aims, supporting activities and actions will be modified to take account of the spatial extent of the features and significance of effects arising from aggregate extraction.

It is important to note that where possible, actions have been linked to the BMAPA Sustainable Development report objectives which can be classified as follows:

Sustainable production

- **Objective 1** - Maintain and improve profitability in order to provide for continuing investment and employment
- **Objective 2** - Maintain and increase investment in dredgers and dredging technology in order to improve efficiency and environmental performance
- **Objective 3** - Make the most efficient use of available licensed resources
- **Objective 4** - Minimise the screening activity in the production process
- **Objective 5** - Develop and promote best practice for resource management

Climate change and energy

- **Objective 1** - Reduce the impact of atmospheric emissions released through the production and transport processes
- **Objective 2** - Maximise the efficient use of the dredging fleet

Natural resources and environmental protection

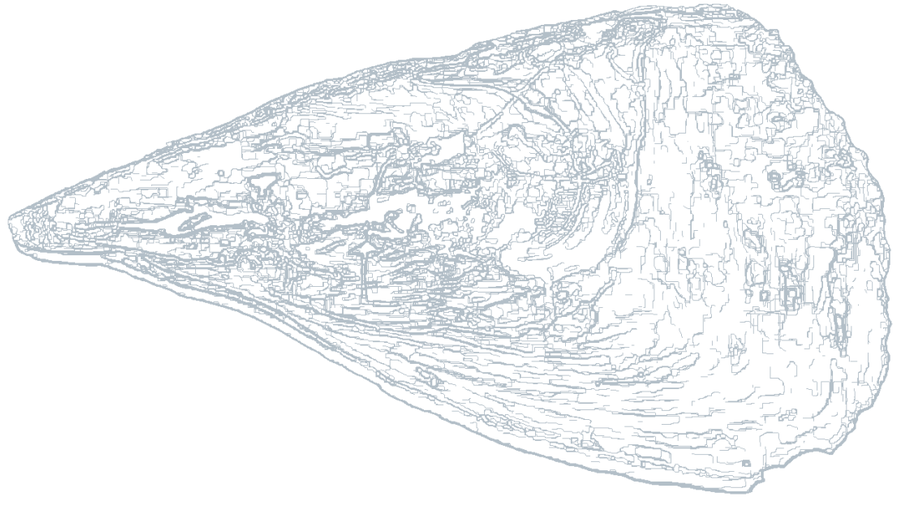
- **Objective 1** - Minimise the spatial footprint of dredging operations through responsible and effective management
- **Objective 2** - Maintain and develop the industry contribution towards the understanding of marine sand and gravel habitats
- **Objective 3** - Maintain and develop industry contribution towards the understanding of Britain's marine historic environment
- **Objective 4** - Maintain effective controls to minimise the potential for pollution to the marine environment

Creating sustainable communities

- **Objective 1** - Improve the occupational health and safety of the marine sector's employees
- **Objective 2** - Improving employee development through vocational training
- **Objective 3** - Increasing the transparency of activities, and maintaining and developing further liaison with other marine stakeholders

For more information on the sustainability indicators described above, please see the BMAPA SD reports produced annually and available from www.bmapa.org. In addition to this document, BMAPA and The Crown Estate produce annual area dredged reports which can also be accessed from BMAPA's website.

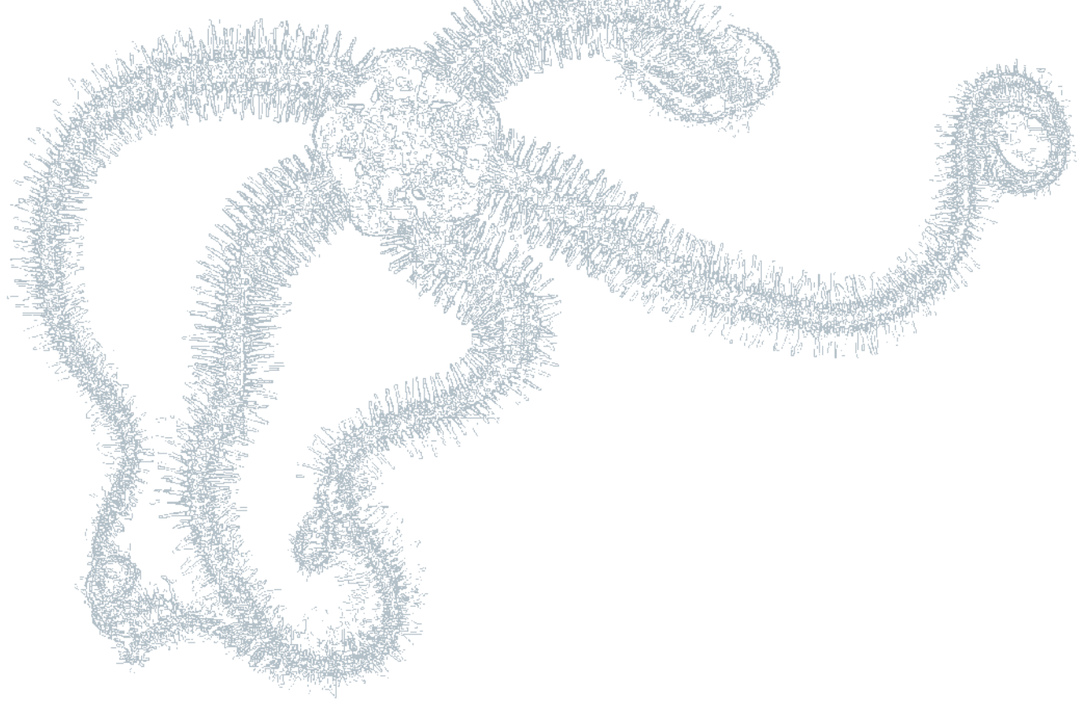
Aim	Supporting Activities	Action
1. No significant adverse affect on algal species listed within the UK BAP during the extraction of aggregates from the marine environment.	a) To map the extent of UK BAP alga likely to be present in the region and assess the likely potential impact upon them.	i) Map the extents using available data by December 2012.
	b) Minimise the area dredged and therefore directly impacted by aggregate extraction and influenced by the sediment plume.	ii) Review data produced to support Objective 3 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	c) Minimise screening activities wherever practicable to minimise turbidity and suspended sediment within the water column.	iii) Review data produced to support Objective 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
2. No significant adverse affect on bird species identified within the UK BAP through the dredging or transportation of marine aggregate.	a) To map the extent of UK BAP bird species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extents using available data by December 2012.
	b) Ensure that dredging vessels navigate within marked shipping lanes wherever practicable.	ii) Review data produced to support Objective 3 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	c) Minimise the effects of dredging on prey items for the species listed in the UK BAP.	iii) Review data produced to support Objective 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	d) Gain a better understanding of the potential interactions of bird populations with marine aggregate extraction.	iv) Review published literature on the occurrence of bird species identified within the UK BAP and assess the potential impacts of aggregate operations on bird populations and behaviour by December 2012.



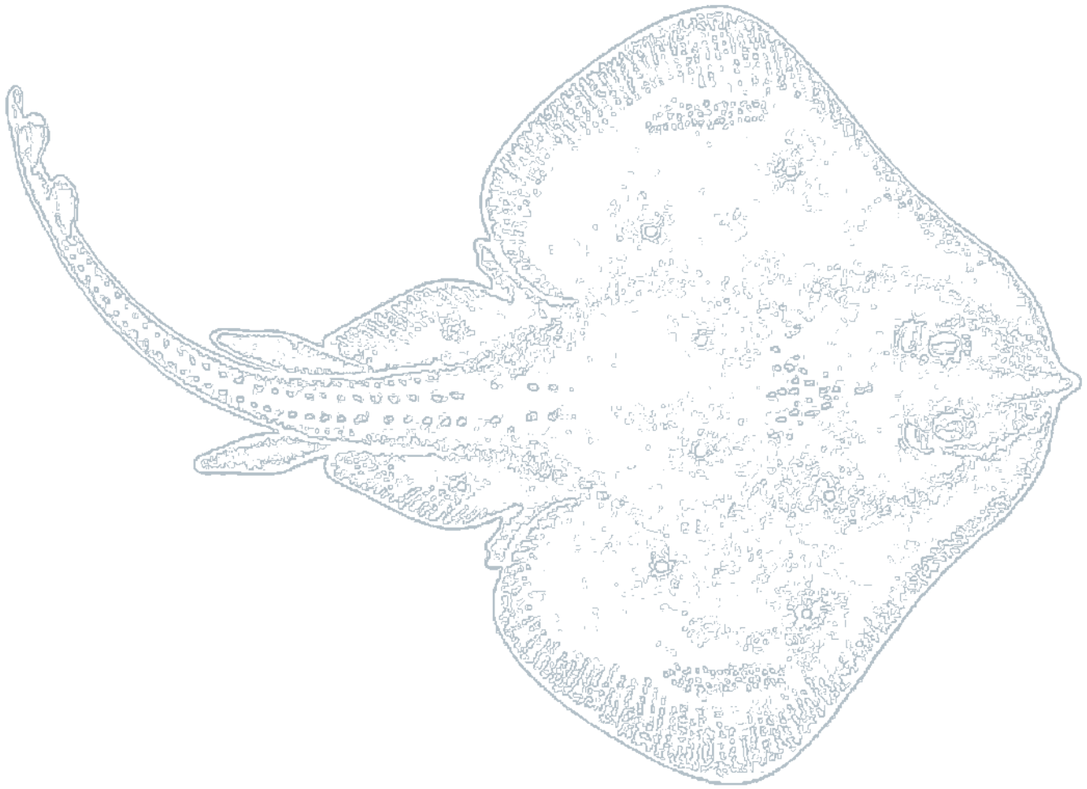
Biodiversity Action Plan (BAP) PLAN

Aim	Supporting Activities	Action
3. No significant adverse affect on populations and life cycles of bony fish species identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP bird species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extents using available data by December 2012.
	b) Minimise the direct impact of dredging activities on bony fish identified by the UK BAP.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	c) Minimise the impact of dredging activities on potential bony fish spawning sites identified by the UK BAP.	iii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	d) Ensure that regional spawning grounds for identified fish species are not adversely affected by marine aggregate extraction.	iv) Map impact areas and potential spawning habitats from REC and Cefas data by December 2012 and review annually to ensure that regional impacts do not adversely affect bony fish species identified in the UK BAP.
4. No significant adverse affect on populations and life cycles of cnidarian identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP cnidarian species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extent of regional populations of cnidarian species identified by the UK BAP from available data sources by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on cnidarian populations and life cycle.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
5. No significant adverse affect on populations and life cycles of crustacean identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP crustacean species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extent of regional populations of crustacean species identified by the UK BAP from available data sources by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on crustacean populations and life cycle.	ii) Review data collected to support Objectives 3 and 4 of the Sustainable Production indicator within the BMAPA sustainable development report by December 2012.
6. No significant adverse affect on populations and life cycles of mollusc identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP mollusc species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extent of regional populations of mollusc species identified by the UK BAP from available data sources by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on mollusc populations and life cycle.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.

Aim	Supporting Activities	Action
7. No significant adverse affect on marine mammals inhabiting or transiting the aggregate producing regions.	a) Review literature and published sources for the background noise levels in the region and the characteristic noise of a typical aggregate dredger	i) Understand the characteristic background noise levels within the regions and map the potential aggregate noise above this level by December 2012.
	b) Minimise the noise footprint of aggregate dredgers and avoid direct contact.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	c) Observe and record observations of marine mammals during the operation of the UK dredging fleet.	iii) Report the occurrence of marine mammals using the SeaWatch reporting forms and assess trends annually (next review December 2012).



Aim	Supporting Activities	Action
8. No significant adverse affect on populations and life cycles of sharks, skate and rays identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP shark, skate and rays species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extent of regional populations of sharks, skate and rays species identified by the UK BAP from available data sources by December 2012 and assess the potential impacts arising from marine aggregate extraction annually thereafter.
	b) Minimise the effects of marine aggregate extraction on shark, skate and ray populations and life cycle.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
9. No significant adverse affect on populations and life cycles of tunicate identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP trunicate species likely to be present in the region and assess the likely potential impact upon them.	i) Map the extent of regional populations of tunicate species identified by the UK BAP from available REC, REA and site specific data by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on tunicate populations and life cycle.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.



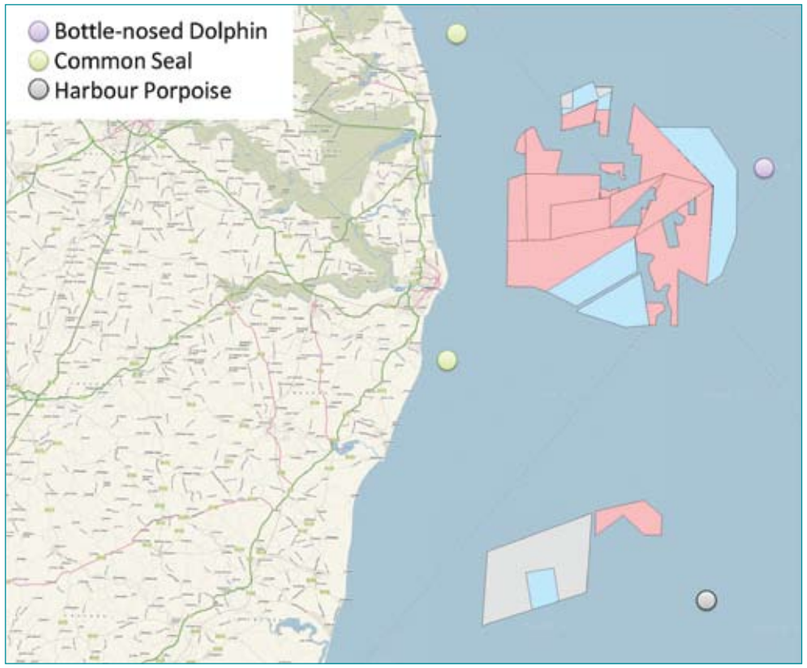
Aim	Supporting Activities	Action
10. No significant adverse affect on turtles inhabiting or transiting the aggregate producing regions.	a) Review literature and published sources for the background noise levels in the region and the characteristic noise of a typical aggregate dredger	i) Understand the characteristic background noise levels within the regions and map the potential aggregate noise above this level by December 2012.
	b) Minimise the noise footprint of aggregate dredgers and avoid direct contact.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
	c) Observe and record observations of turtles during the operation of the UK dredging fleet.	iii) Report the occurrence of turtles using the SeaWatch reporting forms and assess trends annually (next review December 2012).
11. No significant adverse affect on littoral rock habitats identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP littoral rock habitats within the region and assess the likely potential impact of aggregate dredging upon them.	i) Map the extent of the littoral rock habitats identified by the UK BAP from available data sources by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on the littoral rock habitats.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
12. No significant adverse affect on littoral sediment habitats identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP littoral sediment habitats within the region and assess the likely potential impact of aggregate dredging upon them.	i) Map the extent of regional littoral sediment habitats identified by the UK BAP from available data sources by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on littoral sediment habitats.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
13. No significant adverse affect on sublittoral rock habitats identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP sublittoral rock habitats within the region and assess the likely potential impact of aggregate dredging upon them.	i) Map the extent of the sublittoral rock habitats identified by the UK BAP from available data sources by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on the sublittoral rock habitats.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.
14. No significant adverse affect on sublittoral sediment habitats identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP littoral sediment habitats within the region and assess the likely potential impact of aggregate dredging upon them.	i) Map the extent of the sublittoral sediment habitats identified by the UK BAP from available REC, REA and site specific data by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.
	b) Minimise the effects of marine aggregate extraction on the sublittoral sediment habitats.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.

10. Reporting and review structure

This report establishes the framework and future development of the BMAPA BAP. Production of baseline understanding of the biodiversity resources for each aggregate production region is still required. It is proposed that the tables listed in sections 8 and 9 will be updated annually with any newly acquired data. Whilst these aims, supporting activities and actions will be reviewed annually, due to the nature of data available at the time of the update, not all components of the table may be updated. However, where data is not able to be used to update species and features, the actions and timescales will be amended or adjusted accordingly.

An example of the proposed structure of the baseline and annual update table is provided below:

Marine Mammals – East Coast



Sightings 2012:

4 sightings of marine mammals were observed during 2012:

- 2 Common Seals
- 1 Harbour Porpoise
- 1 Bottle-nosed Dolphin

The occurrence of these marine mammals within the area, and observation of these species by aggregate dredgers suggests that aggregate dredgers do not disturb marine mammals significantly.

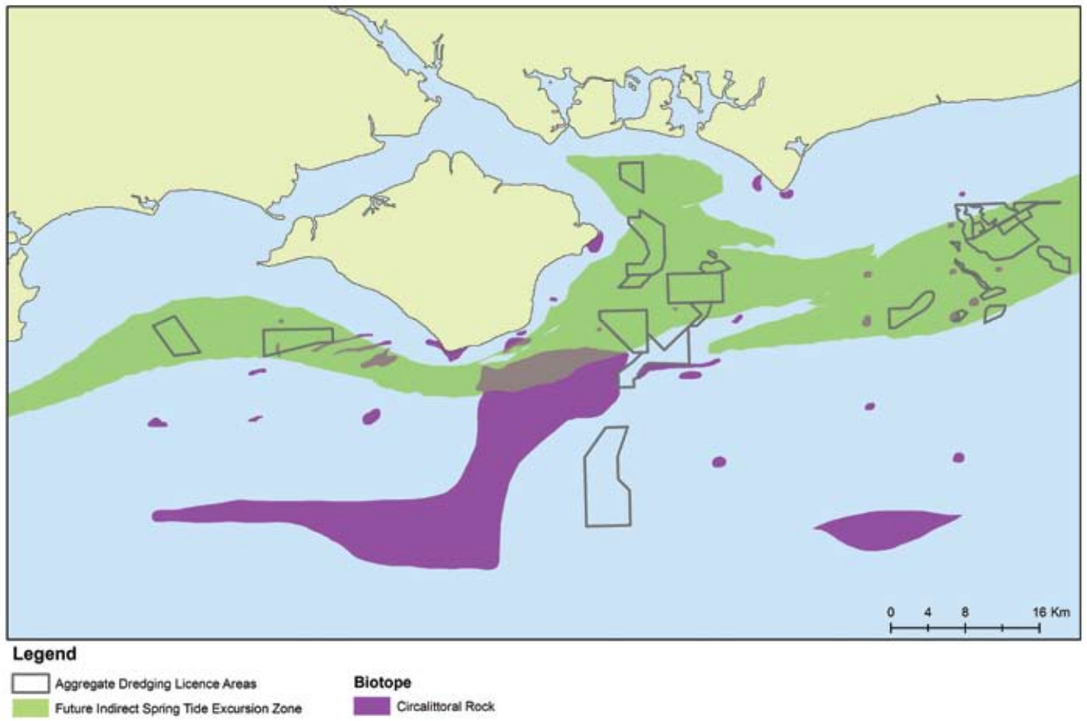
However, given their priority for conservation within the UK BAP, it is pertinent to review their sensitive to the noise produced by aggregate dredgers within the context of regional background noise. The most recent research for the area shows that aggregate dredgers are as noisy as typical cargo ships travelling at modest speed for frequencies below 500 Hz (Robinson et al. 2011). Broadband noise generated by the aggregate extraction process is elevated at frequencies above 1 kHz, depending upon the aggregate type being extracted – gravel generating higher noise levels than sand.

The licence areas within the aggregate producing region are located within a well used shipping region. Recent aggregate data shows that dredgers constitute around 11% of the traffic within the region and therefore constitute a small fraction of the noise generated by shipping using the region.

Aim	Supporting Activities	Action	Performance Against Action		2013 Action
7. To not significantly affect the marine mammals inhabiting or transiting the aggregate producing regions.	a) Review literature and published sources for the background noise levels in the region and the characteristic noise of a typical aggregate dredger	i) Understand the characteristic background noise levels within the regions and map the potential aggregate noise above this level by December 2012.	Literature review has identified the background levels of activity and noise in the region, and the typical noise produced by an aggregate dredger. It has also mapped the sightings of BAP species noted during the action period.	✔	i) No further actions
	b) Minimise the noise footprint of aggregate dredgers and avoid direct contact.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.	The BMAPA Sustainable development report shows that the following trends can be observed within the area dredged and loading time data: **Area dredged (km^2)**: 2009: 123.63; 2008: 137.9; 2007: 134.67; 2006: 140.6 **Tonnes loaded per hour**: 2009: 840.14; 2008: 859.12; 2007: 783.57; 2006: 707.41 As a result of these metrics, it can be seen that the area dredged is reducing whilst the tonnes loaded per hour dredged is increasing.	✔	ii) Continue to monitor the performance of aggregate dredgers in the context of marine mammals and aim to continue to downward trend in indicators.
	c) Observe and record observations of marine mammals during the operation of the UK dredging fleet.	iii) Report the occurrence of marine mammals using the SeaWatch reporting forms and assess trends annually (next review December 2012).	As mentioned above, a number of marine mammals have been observed from aggregate dredgers. This has helped our understanding of the distribution of these species, and shown that they do not avoid aggregate dredgers.	✔	iii) Continue to report sightings of marine mammals to assess their sensitivity and distribution.

Circalittoral Rock Habitats – South Coast

Circalittoral Rock Habitats and theoretical dredger Plume extents:



Aim	Supporting Activities	Action	Performance Against Action		2013 Action
13. To not significantly affect the circalittoral rock habitats identified by the UK BAP during the extraction of marine aggregates.	a) To map the extent of UK BAP circalittoral rock habitats within the region and assess the likely potential impact of aggregate dredging upon them.	i) Map the extent of the circalittoral rock habitats identified by the UK BAP from available REC, REA and site specific data by December 2012 and review annually to assess the potential impacts arising from marine aggregate extraction.	The extents of the circalittoral rock extend to 0.38km^2 within dredging areas. Beyond the dredging areas, a maximum of approximately 58.05km^2 could potentially be affected by secondary plume affects. However, overall this represents 14% of the regional circalittoral rock resource.	✔	i) Modify the maps of circalittoral rock habitats identified by the UK BAP from available monitoring and research data and review annually the potential interaction with dredging activity.
	b) Minimise the effects of marine aggregate extraction on the circalittoral rock habitats.	ii) Review data produced to support Objectives 3 and 4 of the Sustainable Production indicators within the BMAPA Sustainable Development report by December 2012.	The BMAPA Sustainable development report shows that the following trends can be observed within the area dredged and loading data: **2009** / **2008** / **2007** / **2006** **Area dredged (km^2)**: 123.63 / 137.9 / 134.67 / 140.6 **Tonnes loaded per hour**: 840.14 / 859.12 / 783.57 / 707.41 As a result of these metrics, it can be seen that the area dredged is reducing whilst the tonnes loaded per hour dredged is increasing.	✔	ii) Continue to monitor the performance of aggregate dredgers in the context of circalittoral rock and aim to continue to downward trend in indicators.

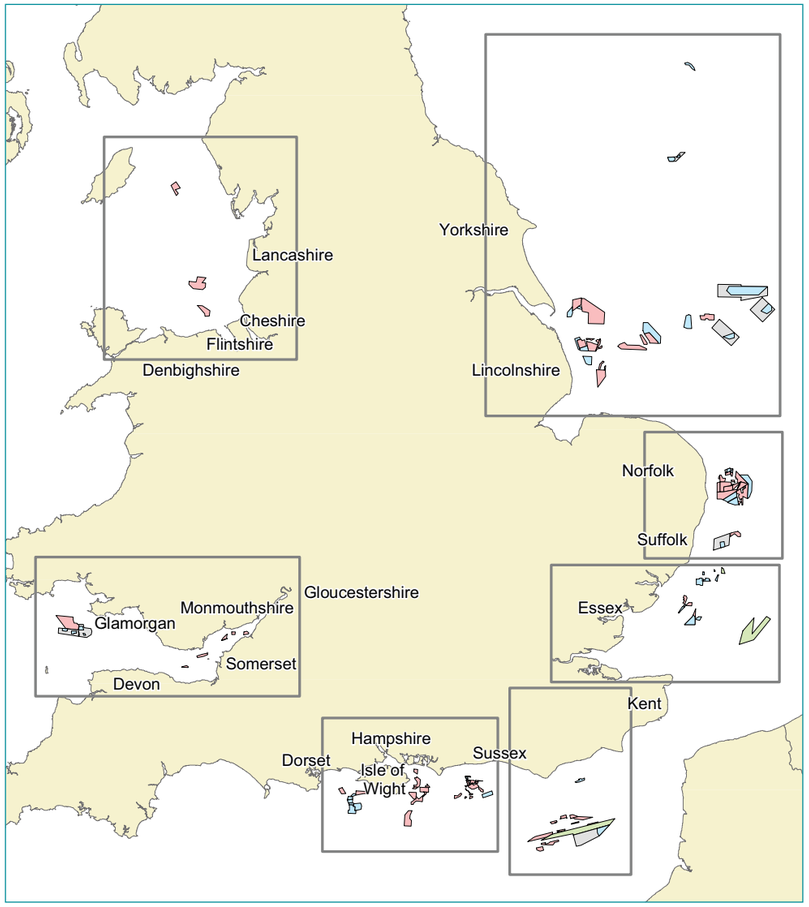
11. Other components of the BAP

In addition the information provided above, local BAPs and industry documents are also relevant to this BAP. This section of the document provides information on these local and industry BAPs.

11.1. Local BAPs

Local BAPs form a network across the UK. They supplement the information provided within the national BAP and provide more specific actions for the local habitats and species identified. Where appropriate, local BAP data and actions will be incorporated into the annual BMAPA BAP document.

Local BAPs to be considered in this document are highlighted in the diagram below:



11.2. Company BAPs

Several of the BMAPA member companies also produce BAPs for their wider operations or for particular licence areas. This information will feed into and support the wider BMAPA BAP process that is being developed, and lit is envisaged that the production of an overarching the regional BMAPA BAP will be aligned to satisfy the objectives and requirements for any existing these company specific BAPs.

The BAP Strategy and associated implementation plan has been produced by BMAPA in conjunction with MarineSpace Limited.

mpa
essential materials
sustainable solutions

The British Marine Aggregate Producers Association is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries

British Marine Aggregate Producers Association
Gillingham House
38-44 Gillingham Street
London
SW1V 1HU

Tel +44 (0)20 7963 8000
bmapa@mineralproducts.org
www.bmapa.org

Printed on FSC certified 100% post-consumer reclaimed material