



WWF

for a living planet

Marine Renewable Energy for the UK

Policy Position

January 2005

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1. INTRODUCTION

1.1 Climate change

Climate change is a major global problem requiring effective global-to-local solutions if greenhouse gas emissions are to be reduced. It is one of the most serious environmental challenges to face our planet – hence, urgent and real action is needed now to address its potential impacts on many species and habitats, as well as people and their livelihoods.

WWF is working in the UK and throughout the world to raise awareness about the impacts of climate change and the many solutions available. In particular, we are calling on the UK government and devolved administrations to implement a significant switch from fossil fuel-based electricity generation to renewable energy sources in order to reduce the level of UK greenhouse gas emissions (ghg). In 2003, the level of UK ghg emissions was recorded at 179 million tonnes carbon (MtC) – an increase of approximately 2MtC over the previous year (Defra 2004)¹.

One of the main drivers behind the development and uptake of renewable energy technologies is the need to reduce emissions of greenhouse gases in general and CO₂ in particular. In June 2001, the Kyoto Protocol was approved by 170 countries and becomes effective in 2005. The UK committed itself to a 12.5 per cent reduction in greenhouse gases on 1990 levels by 2008-2012. The government has subsequently set itself a domestic target to reduce CO₂ emissions by 20 per cent from 1990 levels by 2010. Similarly, the Renewables Obligation (RO) was introduced in 2002, under which UK electricity suppliers must now source 15.3 per cent of electricity from renewables by 2015.

Furthermore, in the Energy White Paper (February 2003) the UK committed itself to take steps to reduce CO₂ emissions from the UK economy by some 60 per cent from current levels by 2050. It also acknowledged that leaving action to the last minute was not an option and that serious progress was needed by 2020. The Scottish Executive has an even more ambitious target of obtaining 40 per cent of Scotland's electricity from renewables by 2020².

1.2 Current UK policy

At present, around 30 per cent (or 58.7 MtC) of the UK's CO₂ emissions are from the power sector, and are produced by burning fossil fuels to generate electricity – for example in coal-fired power stations. However, renewable energy technologies such as wind, wave and solar produce clean electricity and produce no ghg emissions. WWF believes we need to switch to forms of electricity generation that do not produce CO₂. For example, just one modern wind turbine would save 4,000 tonnes of CO₂ emissions annually³.

Therefore, WWF is fully committed to promoting the development and uptake of the right renewable energy technologies in the right places, and improving energy efficiency, in order to reduce and replace fossil fuels – thereby lessening the environmental impact of the UK power sector.

Far greater renewable resources exist offshore around the UK, so it is clear that some development will be situated in the marine environment. This is acceptable, provided the resources are developed in a sustainable manner, have minimal adverse impact on marine wildlife and do not affect the integrity of internationally and nationally important marine and coastal sites. For example, there should be a presumption against construction in the Strangford Loch, Lundy and Skomer Marine Nature Reserves (MNRs).

While WWF recognises the importance of marine renewable energy technologies to combat ghg emissions and climate change, it is a fact that they are not necessarily environmentally benign and may have some temporary and long-term impacts on the local marine environment. With the exception of tidal barrages, most developments operate over relatively short time periods and most areas can be restored after the renewable sites are dismantled, especially when compared with the lengthy and large adverse impacts that large nuclear and coal-fired power stations have on the environment.

WWF therefore supports the promotion of new marine renewable energy technologies, so long as the benefits in terms of emissions reductions are balanced against localised impacts on the marine environment. However, given that many marine renewable energy technologies are comparatively new, continued monitoring and research is needed for continuous assessment.

1.3 Purpose

This paper provides an overview of some of the solutions to reduce UK ghg emissions and tackle climate change, and reviews the main issues surrounding the different types of marine renewable technologies (shallow, deep, coastal, nearshore and offshore). It also considers the potential for energy capture and climate change mitigation, and the potential impacts developments may have on the UK marine environment, including impacts on biodiversity and local habitats.

WWF has long supported, encouraged and proposed measures to mitigate climate change and protect the environment, and believes that marine renewable energy technologies have a major role to play in reducing UK ghg emissions and meeting the country's Kyoto commitments. However, it is important that this development takes place with effective planning and protection for the broader marine environment. WWF therefore believes that all renewable energy projects can and should be sited sensitively and sensibly in areas where they capture much energy and minimise the potential impacts to the marine environment, with full Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs) completed.

This document provides a summary of the impacts which are thought to be most significant for the marine environment, and the scale of marine renewable energy resources the UK could harvest for its benefit.

2. MANAGEMENT AND PLANNING IN THE MARINE ENVIRONMENT

2.1 UK Energy Act

The UK Energy Bill (2003), now the Energy Act (2004), made legislative changes to enable development of marine renewable energy beyond 12 nautical miles (nm). A key part of the new legislation was to declare a Renewables Energy Zone (REZ) to the extent of UK seas. However, although new renewable energy developments are urgently needed to cut the UK's CO₂ emissions, complementary legislative protection of marine habitats and wildlife of national importance has not kept pace with this process.

2.2 UK Marine Act

WWF believes a new comprehensive **Marine Act** is needed to ensure the sustainable use of our seas. This would ensure that the right renewable technology is built in the right place to minimise any adverse environmental impacts and to resolve any issues that arise in combination with other human activities. Therefore, we believe that the creation of REZs should take place in the context of an overarching strategy for marine spatial planning for all UK seas. This would ensure that all users and uses of UK seas are managed in an integrated manner, in line with the government's commitment to develop an ecosystem approach as formally endorsed at the 5th North Sea Conference (March 2002)⁴, and outlined in the *Safeguarding our Seas* report (Defra, 2002)⁵.

Furthermore, WWF believes SEAs of new proposals in the marine environment should be carried out on an integrated spatial planning basis, rather than by the current sectoral approach which fails to take into account the cumulative impacts of many offshore activities.

2.3 Planning

UK seas are a huge potential resource for renewable energy that is largely untapped. In addition to offshore wind farms, new (shallow, deep, coastal, near-shore and offshore) wave and tidal energy installations are being developed and should be investigated fully. Valuable lessons can be learned from existing sites in the oil and gas sector on access and rights concerning fisheries. For example, early

dialogue should be established with fishermen and other stakeholders to avoid potential conflicts and to engage all sea users in the first stages of planning and decision-making.

2.4 Financial costs

WWF recognises that the installation of new, large marine renewable energies will need substantial financial support. However, like any emerging technology or industry, once they are established and economies of scale are increased, the capital costs decrease. Also, the estimated costs of some resources such as offshore wind are now beginning to compare favourably with those of new build conventional power stations, especially if all the external environmental costs are internalised. Thus, the developers involved in the creation of a low-carbon UK economy will require substantial immediate and long-term financial support from government in order to create a level playing field, in line with the billions of pounds spent by the government subsidising the coal, gas and nuclear power industries. In fact, an allocation of approximately £130 million of government funding dedicated to the 50MW deployment of wave and tidal stream renewable energy technologies was called for by the British Wind Energy Association (BWEA) recently in its report *Into The Blue* (May 2004)⁶.

WWF therefore recommends that the UK government commits to immediately and substantially increasing its funding to research, development and performance of renewable energy technologies, especially the emerging marine-based ones which have huge potential energy capture but are not yet commercially competitive, such as wave power. Significant investment is also required to strengthen the National Grid and to improve connections in key areas across the UK for new small and large renewable generators. As it is acknowledged that the single most serious barrier to the successful exploitation of marine renewable energy in the UK is the difficulty of network connection, work is urgently needed to ensure the UK's electricity grid network is capable of receiving electricity from small, multiple sources in remote areas and transmit it to the main demand centres such as the south-east of England⁷.

3. RENEWABLE ENERGY TECHNOLOGIES

3.1 Benefits

Renewable energy sources such as wind, wave and tide are defined as clean energy sources that occur naturally and repeatedly in the environment and can be harnessed for human benefit. One main benefit of using renewable energy technologies for electricity generation is that they produce neither greenhouse gas emissions nor waste.

In contrast, the CO₂ emissions from fossil fuel-based electricity generation range from an estimated 445.5g of CO₂/kWh in a CCGT (Combined Cycle Gas Turbine) to as much as 986.5g of CO₂/kWh in a coal-fired power station with Flue Gas Desulphurisation (FGD)⁸.

The development of renewable energy technologies could also create jobs as new industrial activity is stimulated, so contributing to the three pillars of sustainable development – a balance of environmental, social and economic policies. Recent analysis has shown that more than 30,000 jobs could be created in the UK if the government committed to a target of 10 per cent of electricity from offshore wind in the next 10 years⁹. Another study, focusing on north-east England, found that more than 10,000 direct jobs would be created in the manufacture, installation and maintenance of wind turbines, as well as some 20,000 new jobs in businesses supplying components and services to the wind industry. The BWEA has estimated even higher numbers, suggesting that the wind sector alone (representing 3 per cent of the total renewables portfolio in 2003) already employs some 4,000 people in the UK¹⁰.

3.2 Policy positions

At present, there are a number of different types of marine renewable energy technologies available and/or under development in the UK. WWF believes they are important for climate change mitigation and have a place in the UK seas. The right renewable technology should be built in the right location to minimise any adverse environmental impacts on marine species, biodiversity and habitats.

For example:

i) Wind power – WWF supports the development of wind energy technologies and their use to capture wind energy for electricity generation. However, each proposal must be carefully considered to assess emissions savings and the effects of such developments in combination with other human impacts on the marine environment, so that any unacceptable adverse impacts are avoided.

ii) Wave power – WWF not only supports the use of wave power technologies such as the oscillating water column shoreline device (Limpet) and the floating sea-snake articulated cylinder system (Pelamis) in Scotland, but also the utilisation of this huge energy resource. However, there must also be further investigation, monitoring and assessment of the full impacts of this technology.

iii) Tidal power – this can be generated by displacement of water within an impoundment, such as tidal lagoons or barrages, or tidal/current stream generators. Although tidal lagoon and barrage schemes have the potential to generate large amounts of energy in the UK, to date proposed barrage schemes have been expensive and would be likely to result in significant adverse environmental impacts. In comparison, tidal lagoons could be less expensive and potentially less environmentally damaging, but further research is required to determine the potential advantages and disadvantages.

At the time of writing (January 2005), the main lagoon and barrage proposals have included tidal lagoons in Swansea Bay (30 MW) and Rhyl (432 MW) and a tidal barrage across the Severn Estuary (8,640 MW).

Alternatively, tidal/current stream technologies are a relatively newer concept and could well contribute to the UK's overall energy mix. Examples of relatively small tidal/current stream projects capable of delivering power now exist in Yell Sound, Shetland (150Kw) and Lynmouth Bay, North Devon (300kW). However, before WWF can give its full support, all potential impacts that one or a group of small-scale modular systems could have on the marine environment must be carefully assessed.

3.3 Offshore Wind Power

i) Resource

The UK has the largest offshore potential wind resource in the world, with relatively shallow waters and strong winds extending far into the North Sea. The UK has been estimated to have more than 33 per cent of the total European potential offshore wind resource – enough to power the country nearly three times over.

Offshore wind energy is expected to be a major contributor towards the government's 2010 target for renewable generation, and is being taken increasingly seriously by the energy sector. Companies involved in the UK offshore market now include multinational energy and utility companies. There is more than 1GW of projects with planning consent waiting to be built, and a second round of offshore tenders from the Crown Estate, with a total of 7.2GW, is awaiting application – equivalent to 7 per cent of UK supply (BWEA, 2004)¹¹.

ii) Environmental impacts

The siting of wind turbines in the marine environment will produce a different set of impacts to those on land. Although WWF fully supports the uptake of wind energy projects, it also believes that not enough is known about the marine impacts of offshore wind projects, and that continued research is needed in order to monitor and address any temporary adverse impacts. The issues, both positive and negative, of most interest to WWF are described below.

Emissions

During operation, no atmospheric pollutants are emitted by wind turbines, nor waste produced. A study into a 27-turbine wind farm, with an annual power output of 8,300MWh and a 25-year lifespan, concluded that the avoided emissions (or carbon savings) over its lifetime would be 90,000 tonnes of CO₂ (Waters et al.1996)¹².

Wildlife

The significance of any impacts on bird life will very much depend on the species and habitat involved. Disturbance to wildlife by human activities (e.g. new build development) can be site- and season-specific and may cause disturbance to local, national and even international species such as over-wintering birds.

The available evidence suggests that wind farms can occasionally pose three main problems for birds – disturbance, habitat loss or damage, and/or collision. Birds may be scared away from their usual locations by construction noise or the presence of vehicles or craft during construction and maintenance, or by the operating turbines themselves.

The wind farm, and its associated infrastructure such as cables and pipelines, may physically destroy birds' feeding, breeding or rafting sites. Collision with the turbine tower or blades could result in bird mortalities, particularly in storms and poor visibility. However, it is believed that very few birds are killed each year by a wind turbine compared with the thousands, possibly millions, killed by cars each year in the UK. Therefore, with thorough research, prior consultation and planning, wind farms can be carefully sited with minimal impact on bird populations.

Disturbance of the seabed

Most offshore wind turbines require foundations on the seabed. This causes a degree of disturbance to benthic flora and fauna, related to the size and type of foundations used, the number of turbines installed and the relative sensitivity of the seabed habitats.

It will also be necessary to connect offshore wind turbines to the National Grid by means of cabling. It is standard practice to encase and/or bury sub-sea cables so that they are not snagged by anchors or fishing gear, but cable burying is likely to disturb benthic organisms. Therefore, EIAs of wind farm development should ensure that components placed on the seabed or in the water column will not significantly affect marine sediment transport processes.

Other impacts

To date, not enough research has been carried out to quantify the noise emitted underwater by turbines, or to assess vibration effects on benthic communities.

Noise and vibration disturbance

Marine mammals – cetaceans in particular – are vulnerable to interference from underwater noise because they rely on sound to communicate, locate food and understand their local environment. Little is known about the characteristics of underwater noise generated by offshore wind turbines, but this could potentially lead to mammal displacement and loss of access to important habitat.

However, unless vibrations bring about changes in the physical composition of the seabed, little effect on benthic communities is anticipated. There is a greater chance of impacts on fish communities: these are likely to be more significant during the operational phase than the construction phase.

With careful siting of turbines, therefore, the impact of noise and vibration disturbance in the marine environment can be greatly reduced. It is estimated that a wind farm located 350 metres from shore has a operational noise level around 35-45 dB(A). This is slightly more than a quiet bedroom at 20 dB(A) and slightly less than a busy general office at 60 dB(A).

Electro-magnetic disturbance

Underwater cables are known to transmit electro-magnetic fields that can disturb and deter marine species, especially elasmobranchs such as skates and rays. This adverse impact should be considered when planning the siting of cables. Areas of the seabed that are important habitats for elasmobranchs should be avoided and further research, monitoring and evaluation of the impacts of cables should be undertaken¹³.

Conflicts with other sea users

Navigation and oil spill risks may be increased if new offshore developments are located close to shipping routes. There are likely to be conflicts with other users in some areas of UK seas, particularly in terms of access to the waters and the seabed. Potential conflicts should be fully assessed both as an

element of SEA and ideally by implementation of marine spatial planning, so that all impacts, including those caused by combination with other activities, can be properly assessed and managed.

3.4 Wave Power

UK government funding for research and development of wave energy technologies was discontinued in the 1980s, when it was disputedly viewed as uneconomic and technically problematic. New developments, however, show that obtaining energy from the waves is technically feasible and able to compete. Although WWF welcomes news from the DTI (August 2004) of a £50 million fund to help ensure the UK is a world leader in harnessing wave and tidal stream power as a potential source of renewable energy, we believe the government should further increase and sustain high levels of funding (year on year) for such marine renewable industries.

i) Resource

Resource estimates indicate that wave power could produce 35 TWh/yr of electricity by 2025 (DTI 1999)¹⁴ and could provide at least 20 per cent of the UK's current electricity requirements.

Recently around the UK, new wave energy projects have been proposed and a few are now operating – for instance, the oscillating water column shoreline device (Limpet) on Islay, and the floating sea-snake articulated cylinder system (Pelamis), also in Scotland.

ii) Environmental impacts

However, because only a small number of wave energy projects exist at present, little investigation of the potential impacts on marine and other wildlife has been carried out and further research is necessary. Many issues are similar to those presented by the development of offshore wind, particularly where they concern the effects of introducing a new structure into the existing marine environment.

3.5 Tidal Power

i) Resource

It has been estimated that the maximum technical resource for tidal energy in the UK is 53 TWh. This is equivalent to 15 per cent of the UK's current electricity demand. As much as 90 per cent of this potential is located in just eight sites, with the Severn Estuary providing the greatest potential (Boyle 1996)¹⁵. However, tidal barrages are very expensive to build (perhaps £10 billion for the 8GW Severn Barrage proposal, estimated to deliver around 6 per cent of the UK's electricity) as well as being highly damaging to the entire estuarine ecosystem.

This technology utilises the action of the tides to capture energy and relies upon the ebb and flow of the twice-daily tides. The technology can be simple mills, using a pond to trap water at high tide and releasing it at low tide to drive a water wheel. But the most popular technology is where a barrage, turbines and sluices are constructed across the mouth of an estuary.

ii) Environmental Impacts

- Tidal Barrages

Emissions

No atmospheric pollutants (such as ghg) are emitted, nor waste produced, during operation of tidal technologies. The estimated level of emissions of CO₂ displaced from tidal barrages is 734 tonnes per GWh.

Hydrodynamic regime

The construction of a tidal barrage affects the hydrodynamic regime of the local estuarine environment in which it is built – causing higher minimum water levels, lower high water levels and reduced action of the

waves, and subsequently changing sediment characteristics, salinity and water quality. Such effects are important to assess, because reduced tidal ranges will significantly impact upon an estuary's marine habitats, in particular its mudflats and shorelines. Smaller tidal variation will expose less of the intertidal and mudflat areas behind the barrage, so the feeding grounds for many species will be reduced. Also, scouring of riverbed mud by the movement of a given river will be reduced, resulting in lower levels of suspended fine-grained sediment in an estuary.

Water quality

Slower currents and lower tides caused by tidal barrages will reduce water turbidity and allow more sunlight to penetrate. This will cause greater primary biological reproduction with the resultant species becoming food sources for the filter-feeding invertebrates. However, this effect may be countered by the reduction in estuary mud levels, which itself leads to a reduction in the primary food supply for the invertebrates.

A reduction in tidal amplitude could also affect water quality, as the ability of the estuary to disperse and dilute pollutants would lessen. Salinity levels may change as a result of barrage construction in the upper estuary, and the amount of freshwater that enters the outer estuary may be reduced. In turn, this is likely to reduce numbers of saltwater species and increase numbers of freshwater species within a barrage area.

Wildlife

Estuaries are major spawning grounds for fish and other organisms as well as important sites for migratory birds of national and international importance. A tidal barrage will act as a barrier to migratory fish which may use the estuary channel. A lower tidal amplitude and reduction in areas of mudflats and salt marshes due to barrage construction will significantly affect the breeding and feeding zones of these organisms and may lead to a reduction in bird numbers. And because bird feeding habits are related to estuary substrate types, a change in the erosion and deposition of estuarine sediment will change and/or restrict the area of preferred feeding grounds of certain migratory or over-wintering birds.

Other impacts

Construction of tidal barrages in particular is likely to cause significant disruption in estuaries due to the associated large increases in traffic volume and large amounts of new plant and equipment. Shipping and the recreational value of the estuary may also be affected. Displacement of existing economic activity such as fishing and aggregates industries would also be affected (for example, the Severn Barrage would displace three major ports – Bristol, Cardiff and Newport).

Furthermore, British and other estuaries are well-known for their high ecological value and much of the surrounding land may be designated for nature conservation. They attract bird watchers, water-sports enthusiasts and other visitors, so the construction of a tidal barrage would have a significant impact on the appeal of an estuary.

- Tidal Lagoons

Tidal lagoons are a relatively new concept, so much more detailed information is required to investigate, monitor and assess their full impacts on the marine environment. For example, tidal lagoon impoundment structures consume an area of the seabed and separate it from the natural marine ecosystem. Furthermore, outside the man-made lagoon, tidal waters are diverted by the structure, leading to changes in the sediment regime around it. Therefore, as tidal lagoons comprise circular impoundment structures, those structures are better located where the tidal range is high and where there are broad tidal flats at minimal depth.

- Tidal/Current Stream Technologies

This new renewable energy technology uses the power from sea current streams to generate electricity, and could provide an estimated 36 TWh of electricity to the National Grid. However, it is unlikely that more than about 2 TWh/yr will be generated by 2025 (DTI 1999)¹⁶.

Generally, the energy is captured using submarine or kinetic energy converters, which can be visualised as underwater wind turbines. An advantage of using this type of technology is that only relatively low velocities of water are needed to generate electricity. This means that the converters (or turbines) can be smaller than similar developments on land, and will use fewer raw materials.

While WWF supports the development of renewable energy technologies, and recognises their importance in achieving the UK's renewable energy and CO₂ emissions reduction targets, all potential impacts that one or a group of small-scale modular tidal stream systems could have on the marine environment must be carefully assessed.

3.6 Remarks

Other considerations also need to be taken into account. For example:

- Impacts on birds of hazard lighting needed on turbines for ships and aircraft;
- adverse affects of antifouling paints on organisms (if used, they should be safe and TBT-free);
- the flight patterns and migration routes of bird populations; and
- positive and negative impacts of new constructions, whether they act as alien substrates or as potential new habitats for colonisation, such as artificial reefs or No-Take Zones of benefit to fisheries.

Finally, WWF acknowledges the difficulty of measuring the aesthetic impact of any development upon the seascape. However, it may be argued that wind turbines situated several kilometres offshore are less visually intrusive than an onshore turbine – or indeed, nuclear or coal-fired power stations.

4. CONCLUSIONS

It is vital that the UK government honours its national and international commitments to climate change and ramps up its efforts to expand the UK renewable energy market and reduce energy demand. The UK can make good use of its vast resources of marine renewable energy – especially wind and wave – to replace fossil fuel-based electricity generation and thereby reduce greenhouse gas emissions.

Within this policy, WWF recognises that although offshore renewable energy technologies are clean and do not produce greenhouse gases emissions (or radioactive or ash wastes), they are not completely environmentally benign, and can have different physical impacts. Therefore, action must be taken to ensure that the right technology is built in the right place, in order to ensure potential adverse impacts on the marine environment are minimised and avoided.

At present, there are a number of marine renewable energy technologies available and/or being developed in the UK. WWF believes renewable energy technologies are important for climate change mitigation and have a place in the UK seas.

It is also vital that all renewable energy developments are sited sensitively and sensibly in the marine environment. Careful planning of our seas is needed to ensure the right technology is developed appropriately, in the right place, and with full consideration of the benefits as well as the potential adverse impacts on the marine environment.

Therefore, WWF strongly advocates the integrated management of all human activities and developments, including renewables, in the seas around the UK, in order to protect the marine environment. This can be achieved by implementing spatial planning and an ecosystem approach, enabled through a new comprehensive **UK Marine Act**.

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ANNEX 1:

WWF'S DRAFT MARINE BILL: A VISION FOR THE STEWARDSHIP OF THE UK'S SEAS

In December 2004 the Department for Environment, Food and Rural Affairs launched its Five Year Strategy, *Delivering the Essentials of Life*¹. Measures set out in the document include a Marine Bill – a long-overdue commitment welcomed by WWF. The UK government stated that it was “committed to introduce in the next Parliament a bill to ensure greater protection of marine resources, and simplify regulation, so that all uses of the sea, including for example wind farms, can develop sustainably and harmoniously”.

WWF believes that legislation in the form of a Marine Act can help solve the crisis in our marine environment by establishing a long-term, holistic vision for its management.

However, the government's Marine Bill must be sufficiently robust and comprehensive to reform the way our seas are managed and prevent increasing conflicts of interest around UK shores. To inform debate on the content of the proposed legislation, WWF has developed a *Draft Marine Bill* which outlines how marine wildlife can be protected within a new marine planning system. It also sets out the key principles for achieving the sustainable use of marine resources. WWF's *Draft Marine Bill* demonstrates the multiple benefits to all users of the marine environment.

Why do we need a new Marine Bill?

The seas around the UK are among the most heavily exploited in the world, providing a multitude of important resources and enormous economic benefits through oil and gas reserves, fisheries, transport, dredged materials, renewable energy and tourism. In the future, they may be further exploited for carbon sequestration and bio-prospecting.

Our marine environment comprises an incredible diversity of habitats and species, some of which are of international importance. It is also an important recreational resource for divers, seaside visitors and sailors. But inadequate management of coastal and offshore activities threatens the health of our marine wildlife and the long-term security of maritime livelihoods.

So far, marine legislation and planning have developed in an *ad hoc* manner and on a sector by sector basis in response to the rising pressures of maritime activities. There has been no overall strategy for the management of our seas. Instead, decision-making and jurisdiction over the marine environment is shared by numerous government departments, agencies and authorities. This has led to confusing, fragmented, often conflicting policies and a costly, bureaucratic system of governance that does not effectively promote the health or economic potential of our seas.

- We need a new way of managing our seas – an integrated approach that enables government to plan and manage the UK's marine area sustainably.
- We need a fair and transparent procedure to mediate between conflicting pressures to prevent further over-exploitation of UK marine resources.
- We need to conserve our maritime heritage, encourage investment in the marine environment and protect the wildlife that lives in our seas.
- We need a new Marine Bill to achieve all of this.

What's in WWF's *Draft Marine Bill*?

Statutory Purpose

The *Draft Marine Bill* establishes a long-term vision for managing the marine environment and sets out the key principles for achieving the sustainable use of marine resources. The Bill places a duty of care on stakeholders whose activities impact upon the marine environment to ensure the long-term protection and enhancement of the marine ecosystem.

Marine Spatial Planning

The *Draft Marine Bill* introduces a new strategic planning system for the marine environment similar in concept to the system currently used on land. The Bill provides for stakeholders and local people to help government develop plans that reflect the dynamic nature of the marine environment, taking into account the many locations which possess similar biological features. These plans will identify zones in which it can be presumed that activities will either be authorised or restricted, depending on the other pressures in those locations and their environmental sensitivity. Some zones will continue to be multi-use areas, while others may have seasonal restrictions placed upon certain activities. Each regional marine plan will be subjected to a strategic environmental assessment. The Bill also encourages the pooling, sharing and publishing of data on the marine environment. This will help inform planning in relation to the marine environment and identify information gaps.

WWF believes that spatial planning – which allows for integrated, forward-looking and consistent decision-making concerning the use of the sea – is crucial to an ecosystem-based approach to marine management because without reform of the present marine planning system, biodiversity conservation will be ineffectual. Integrated management of our seas through spatial planning will streamline offshore development decisions and facilitate sustainable projects. Extending spatial planning to the marine environment will stimulate investment by giving developers the efficiency and long-term regulatory certainty they need.

Important UK marine sites

Parts of the UK marine environment have already been identified, mostly under EU law, as areas in need of conservation – yet they continue to suffer from over-exploitation and lack of protection. The *Draft Marine Bill* establishes a network of important UK marine sites which are likely to include designated conservation areas. Chosen because they contain threatened habitats and/or species, these sites will be identified in spatial plans so that they can be properly managed and monitored. A spatial planning system will enable some marine areas to have variable levels of protection, depending on their sensitivity. Some may become No-Take Zones, for example, where all extractive activities are prohibited, either seasonally or permanently. There is evidence that a No-Take Zone can deliver fish stock recovery not just within that area but also in neighbouring zones. However, it is likely that human activities will be able to continue in many sites, provided that the ecological integrity of the area is conserved.

Important UK marine features

WWF's *Draft Marine Bill* gives government a duty of care to conserve important species living in, or travelling through, UK waters. The government will be required to identify and publicise a list of species and to monitor their status. The government will also be required to consult stakeholders about species on the list, revising it where necessary. Where information about a species is lacking, the Bill provides for a precautionary approach. To ensure the list is respected by all users of the marine environment, the Bill includes punitive measures against anyone who deliberately or recklessly damages, destroys or disturbs an important feature. This part of the Bill will give meaningful protection to a wide variety of marine biodiversity, from coldwater coral to basking sharks. It will encourage all users of the marine environment to consider more seriously their impact on wildlife which is often hidden from view.

WWF recognises the urgency of legislative action for the marine environment. We hope publication of the *Draft Marine Bill* will prompt all stakeholders, including the UK government, to get to work immediately on marine legislation. Increasing demands on the marine environment will multiply conflicts of interest, stifle the economic potential of maritime industries and prolong the damage to the ecosystem. A comprehensive, integrated management system based on a strategic marine plan must be delivered without delay. Piecemeal or token conservation efforts will not succeed in reversing declines in marine species and habitats unless there is a holistic solution to these critical problems.

WWF thanks Wildlife and Countryside Link's Marine Task Force for its advice and expertise during preparation of the *Draft Marine Bill*.

While it has been possible to draft one Bill for England and Wales, WWF has also developed bespoke legislation for Scotland and Northern Ireland to take into account the devolved and unique nature of their own marine management.

For further information on the WWF Draft Marine Bill, visit www.wwf.org.uk/marineact or contact Janet Brown, Senior Marine Policy Officer, or Saskia Hervey, Senior Public Affairs Officer, on 01483 426444

1. Delivering the Essentials of Life. Defra's Five Year Strategy. HM Government December 2004
www.defra.gov.uk/corporate/5year-strategy/5year-strategy.pdf