WWF

SUMMARY

WALES

2012

Sustainability | Conservation | Climate Change

Historical changes in Welsh seas: ecosystem trends

WELSH COAST AND SEAS: A SPECTACULAR SIGHT

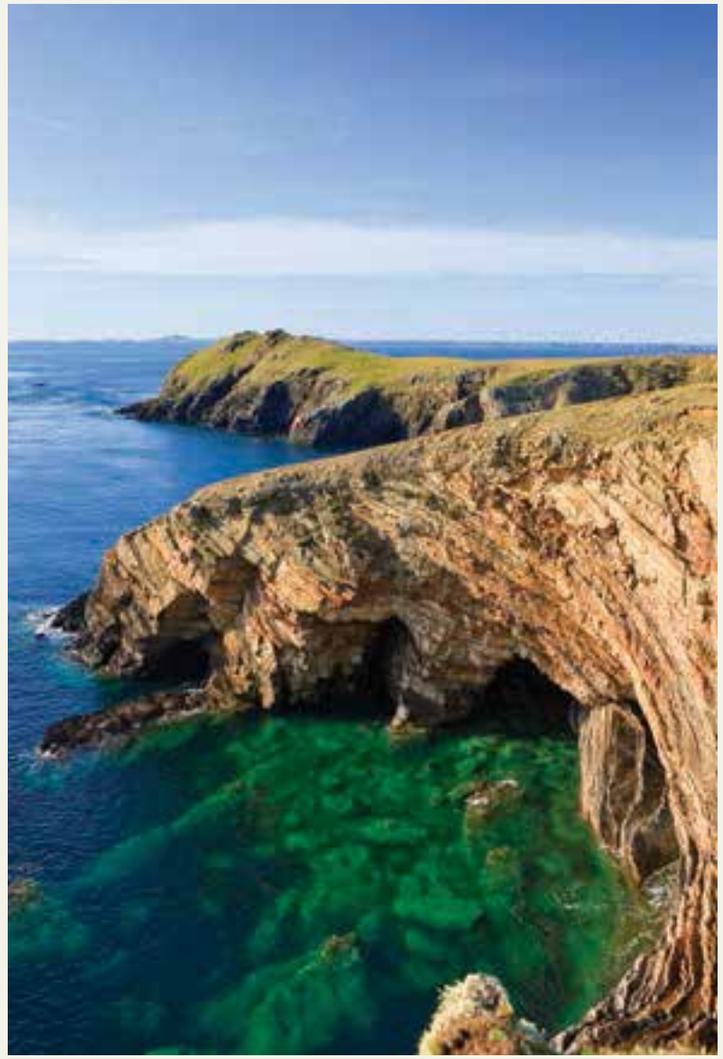
The environment of Wales has for centuries drawn scientists and tourists alike to admire and study its natural beauty.

Descriptions of the Welsh coast and inshore waters go back many hundreds of years, with writers describing and illustrating journals that recorded daily life in coastal communities, through to scientists mapping the coast and studying marine life from as early as the 1800s.

Wales boasts 1,680 miles (2,740km) of the most beautiful coastlines in Europe and is home to Britain's only coastal national park, situated in Pembrokeshire. Rugged shores, sheltered sandy bays, rocky underwater reefs, seagrass meadows, sea caves and banks of mudflats and sandflats support a stunning variety and abundance of marine life. Internationally important seabirds come to breed along the Welsh coast, and many other mobile species like dolphins, porpoises, whales, sharks and turtles can be found in Welsh waters. Fragile and slow-growing maerl beds, pink sea fans and horse mussel beds, along with colourful seaweeds, sponges and urchins live alongside many diverse species of shellfish and seafish.

1,680 MILES

Wales boasts 1,680 miles of beautiful coastline



The Welsh coast provides excellent vantage points to spot seabirds and marine life such as ceteceans.

OUR VISION FOR THE MARINE ENVIRONMENT

WWF is working with government, industry and stakeholders to ensure healthy, well-managed seas where wildlife is flourishing and ecosystems are protected, connected and thriving. We believe that at a time of ever-increasing pressures on the marine environment, Wales needs to take a joined-up spatial approach to managing its seas.

Numbers of spider crab have increased in Wales in recent years. Climate change and fishing activities are thought to be factors.

WHY WE CARE ABOUT WELSH SEAS

We've commissioned research that has identified evidence of changes in marine wildlife and habitats around Wales over the last two centuries.

There have been several recorded instances where species and habitats that once thrived have disappeared due to a range of pressures, including human activity. Coastal landscapes have been altered over time and a number of marine industries have come and gone.

The Welsh coast continues to be a place where man has a close relationship with nature. In the future, traditional uses are likely to be joined by emerging activities and industries, creating increasing competition for space. We recognise that things will continue to change in the marine and coastal environment, with emerging climate change impacts presenting many challenges. WWF wants to ensure that Welsh seas are managed strategically and effectively to ensure space for biodiversity to thrive.

Marine industries and coastal communities continue to change

Welsh seas support a fantastic array of marine life, such as snakelock anemones, commonly found in rock pools around Wales.

HISTORICAL INFLUENCES ON WELSH COASTS AND SEAS

WWF Cymru commissioned research that has examined many sources of historical information about the marine environment around Wales.

This research includes early descriptive material, such as the Parliamentary Rolls of Edward the First in the 13th century, 19th century maps and charts, through to contemporary scientific papers.

The way in which information about marine species and habitats is recorded has undoubtedly changed, becoming more detailed and comprehensive over time. Despite the limitations of working with historical material, there is clear evidence of changes in the marine and coastal environment around Wales. These include declines in geographic range and abundance of a number of marine species and habitats over a period of approximately 200 years.

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Pysgota Penwaig

MARINE WILDLIFE TRENDS:

GEOGRAPHIC RANGE/EXTENT AND ABUNDANCE

200 YEARS OF DECLINING MARINE SPECIES AND HABITATS

OYSTERS

Over exploitation and disease in the late 1800s led to the decline. This is despite cultivation and import from elsewhere.

HERRING

Variable but by the mid-20th century over exploitation and economic factors led to the collapse of the fishery.

STURGEON

Habitat damage especially the obstruction of migration routes and pollution of lower river reaches is probably the major factor.

SKATES & RAYS

Taken in directed fisheries and as by-catch. Common skate is commercially extinct in the Irish Sea.

CETACEANS

Anecdotal reports suggest harbour porpoises were much more common in Welsh waters. Changes in prey species as well as accidental damage in some types of fishing gears are believed to have affected their status.

SEABIRDS - GANNETS

On Grassholm a dramatic increase since the 1800s. Similar pattern at other colonies. Possible reasons are its adaptability to changing prey availability/abundance, high dispersive ability and also possible recovery in numbers from previous persecution.

EDIBLE MUSSEL

Most of the mussel industry in Wales is now supported by “laid” beds taking seed mussel from the wild.

CASE STUDY: HERRING

The abundance of herring in previous centuries and its importance to coastal settlements in Wales is well documented.

In *Brut y Tywysogion (Chronicle of the Princes)* of 1206 it was said that "great quantities of herring were landed at Aberystwyth". In the middle of the 14th century numerous 'herring ports' existed in Wales. By the 16th century "every creek and bay [in Cardigan Bay] had its fleet of herring boats". Nefyn, on the Lleyn peninsula was known as the 'herring capital of Wales'.

5,000

barrels of salted herring exported in 1747

In 1747 nearly 5,000 barrels of salted herring were exported from here and by 1910 there were an estimated 40 boats involved in the fishery, with three or four men in a crew using rowing boats that were launched from the beach. There were clearly periods when herring were scarce and then years when they were abundant during the 19th and early 20th centuries. However by 1918, because of a decline in herring and the occurence of the First World War, there was no longer a herring fishery based at Nefyn. And by the mid 20th century herring fishing had ceased to be a major occupation along the Welsh coast. In 1939 one fisherman working off the east coast of Anglesey is reputed to have recalled spending 10 days fishing for herring and catching only one fish.

The final decline in the herring fishery began between the wars and continued up to the fisheries closures in the 1970s. It has been attributed to a combination of overfishing and economic factors, a pattern that was seen all around the UK. From the early 20th century, steam drifters started to dominate the fleet, taking over from sail.

6,000 TONNES

landed at Milford Haven in 1925

At Milford Haven more than 6,000 tonnes were landed in 1925, a figure that made it the principal landing station for herrings in England and Wales. In 2005 just one tonne was landed at Milford Haven. Eventually there was a ban on herring fishing in the late 1970s, and although it reopened in 1981 it has never been on the same scale.

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CASE STUDY: INTERTIDAL HABITATS AND COASTAL DEVELOPMENT

The most visible change to the coastal and marine environment around Wales has undoubtedly been along the shoreline.

From 12th century fish weirs, and works for Edward the First at Beaumaris castle at the end of the 13th century, to modern ports and harbours it is possible to identify numerous changes. Coastal works have included the draining of saltmarsh, the obstruction of creeks and pills, the construction of canals and breakwaters, and the development of port facilities and coastal settlements.

The draining of marshes and the impoundment of mudflats was a significant and widespread activity in the 17th and 18th centuries for land improvement. The industrial revolution led to massive development of port and harbour facilities to support export of coal, iron, steel, copper, tinplate and other products from the south Wales coalfield. Dredging works on a significant scale were associated with some of these constructions. Works related to the Bute ship canal at Cardiff are one example.

The industrial revolution led to the expansion of Welsh ports and harbours

Coastal lagoons are another habitat type which illustrate how the coastline of Wales has changed over the last two centuries. Human intervention to open up, create or retain lagoons has also been key to their development. The Cemlyn lagoon on the northern Anglesey coast, for example, was formed by a shingle bar restricting water movement out from the basin. This is known to have been present as far back as 1748 and likely to have extended, enclosing the basin during a severe storm in 1859 before which time maps label the basin as marshland. Small vessels used to enter the lagoon through a narrow channel at the western end of the shingle bank. However, in the 1930s a weir was constructed to retain water in the lagoon to improve the habitat for wildfowl.

Other examples where human activity has been key to lagoon development along the Welsh coastline are at Pickleridge lagoon on the upper shore of the Gann Flats in Milford Haven, which is the relic of a sand/gravel extraction pit; Aberthaw Lagoon which is the impounded remains of the mouth of the River Thaw behind Aberthaw Power Station; Rhyl marine lake which was built in the 1890s of the east side of the River Clwyd estuary; and the Cob Pool at Malltraeth, which was enclosed as part of the reclamation of the Cefni estuary in 1788-1790 (Bamber et al., 2001).

The effects of coastal development, associated land claim, and the construction of coast protection works have clearly been a factor in the changing nature of the coastline. The table below illustrates the changes in intertidal area in a number of south Wales estuaries which are mostly attributed to human activity such as the construction of dams, sea defences and embankments[1].

Changing extent of intertidal area in some Welsh estuaries between 1876 and 2000.

Estuary	Area at mean high water in 1876 (ha)	Area at mean high water in 2000 (ha)
Taf	742	587
Towy	717	707
Gwendraeth	540	404
Three estuaries confluence	2080	1787
Loughor	8254	7060

[1] Bristow, C. & Pile, J. (2003) *South Wales Estuaries Carmarthen Bay: Evolution of estuarine morphology and consequence for SAC Management.* CCW Science Report No. 528.

CASE STUDY: NATIVE OYSTER

The native oyster, *Ostrea edulis*, is known to have been harvested from the waters around Wales since at least Roman times.

The Mumbles or 'Oystermouth' fishery has a long history and oysters from here were considered a great delicacy. The number of people involved shows the significance of this fishery, with around 250 people employed in oyster dredging during the season in 1826, increasing to 400 men involved in the oyster fishery in the mid 1800s[2].

400 MEN WERE INVOLVED IN THE MUMBLES OYSTER FISHERY IN THE MID 1800S

Oyster dredging was the main activity at Milford and Swansea at the end of the 19th century[3]. The decline in oyster beds around Wales is referred to in 19th century reports. Further evidence of the changing abundance and extent of native oysters beds can be seen in the decline and collapse of the industry in the 20th century[4].

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By 1925 oyster dredging in Swansea had come to an end

Today the native oyster is a rarity in the waters around Wales and there are no longer any extensive beds[5]. Overfishing is believed to have been a key factor in the decline of the native oyster around Wales. Pollution from industrial sources was believed to be another factor and unusually high mortalities off Swansea in 1920 might have been brought on by disease, severe weather or pests – but no firm conclusions were drawn on this when investigated[6]. After this mortality event the Swansea oyster beds never recovered and by 1925 there was no longer any oyster dredging in the area[7].

The peak of the oyster fisheries at Mumbles is estimated around the mid to late 1800s, after which the number of boats involved began to decline from a high of approximately 180. A decline in the Oystermouth fishery started to be reported from around the 1860s. The decline continued despite attempts at restocking in the early 1920s. A combination of disease and overworking are thought to have been the reason, including practice of disposing of the shells rather than returning them to the beds to act as a 'cultch' on which spat could settle and support future production[3].

[2] Cliffe, C.F. (1847) *The book of South Wales, the Bristol Channel, Monmouthshire and the Wye*, Hamilton, Adams & Co. London.

[3] Holdsworth, E.W.H. (1874) *Deep sea fishing and fishing boats. An account of the Practical working on the various fisheries around the British Islands with illustrations and description of the boats, nets and other gear in use.* Edward Stanford, London.

[4] Wright, F.S. (1932) *Report of Investigations into the past and present condition of certain oyster beds in the South Wales sea fisheries district.* (pp. 35. London, 1927.) In Ministry of Agriculture and fisheries. Fisheries Investigations. Series II. Vol. XII. No. 4. 1932.

[5] Moore, J. (2002) *An Atlas of Marine Biodiversity Action Plan speies and habitats and species of Conservation Concern in Wales* 2nd Edition. CCW Contract Science Report No.509.

[6] Orton, J.H. (1923) *Summary of an account of investigations into the cause or causes of the unusual mortality among oysters in English oyster beds during 1920 and 1921.* Vol XIII. No. 1.

[7] Jenkins, J.G. (1991) *The inshore fishermen of Wales*. Cardiff.

IDENTIFYING CHANGES IN MARINE ECOSYSTEMS

The research undertaken for WWF Cymru shows us that there has long been an interest in describing and trying to understand the marine environment around Wales and the impact of human activity on it.

It is clear that there have been changes, and that some of these have been very significant in that they have fundamentally altered the way of life on the Welsh coastline.

At the same time descriptions of huge shoals of herring, abundant harbour porpoises and a thriving oyster fishery from the 18th and 19th century mean that what we consider to be typical today is very different from what our predecessors saw. There are many reasons for these changes but it is clear that human activity has not only been an influence but has also been the principal reason in many cases whether through coastal development, resource exploitation or other activities. Today significant pressures are being placed upon Welsh marine ecosystems by human activity.

WWF Cymru believes that action needs to be taken so that marine wildlife and habitats are protected, declines in marine biodiversity are halted and ecosystems are allowed to recover.

Human activity has been the principal reason for changes in marine ecosystems

The impacts on the Welsh coast are changing. They now include climate change and greater pressure for space and resources.

SOLUTIONS FOR CHANGE: THE ECOSYSTEM APPROACH

The significant benefits we derive from the marine environment depend upon healthy ecosystems.

Healthy seas contribute not only to the provision of food and other essential goods and services, they are also important to our quality of life. Marine industries contribute around £2.5 billion to the Welsh economy every year; however, Welsh seas are vulnerable to overexploitation and unsustainable use.

£2.5 BILLION
IS CONTRIBUTED TO THE WELSH ECONOMY EVERY YEAR BY MARINE INDUSTRIES

Managing individual sectors in isolation of each other is insufficient to protect and conserve marine ecosystems. Ecosystem-based management is essential to ensuring healthy functioning ecosystems that can continue to support and deliver valuable goods and services.

Without the scientific endeavour of previous generations, knowledge of changes in the marine environment would not be possible. Monitoring and research are therefore key, not only to help us record what is happening in the marine environment so that we notice changes, but also for us to understand the scale of change. Understanding how and when such changes have occurred is critical to establishing a baseline for restorative management. It provides us with an insight into the ways in which ecosystems may respond in the future to pressures, such as climate change.

MONITORING AND RESEARCH
ARE CRITICAL TO UNDERSTANDING OUR SEAS

The Welsh fishing industry is mainly inshore based. It targets a range of species including crabs, scallops, lobsters and whelks.

SOLUTIONS FOR CHANGE: MARINE PROTECTED AREAS

Marine protected areas (MPAs) are vital in protecting marine biodiversity; they also help to safeguard ecosystem goods and services.

MPAs are areas of the sea that are managed to protect marine life for the future. They can have differing levels of protection; for example, some sites can be multi-use, and others can be reserves where little activity is allowed, to provide a high level of protection for vulnerable wildlife sites and species.

Wales has a large number of MPAs, covering approximately 75% of the coastline and 36.6% of Welsh territorial seas. A number of MPAs in Wales have not been successful in halting biodiversity loss. We're calling for improved management of these sites to protect Welsh seas.

We believe that a well-managed ecologically coherent network of MPAs in the UK, including highly protected sites, will help restore, protect and enhance the marine environment. Marine planning will be an important process to support the establishment of MPAs, ensuring a strategic spatial approach to managing our seas.

We hope that MPAs and marine planning will contribute to efforts to increase the ability of marine ecosystems to adapt to the impacts of climate change.

We are calling for better management of MPAs to protect marine wildlife

Wales has abundant marine life and a diverse range of marine habitats.

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Coastal tourism is important in Wales and relies upon healthy and clean seas.

TIME FOR ACTION TO PROTECT WELSH SEAS

Welsh seas are special. However, it is clear action is urgently needed to improve and protect the health and productivity of Welsh seas today and for the future.

Following a decade of successful campaigning by WWF and others, the Marine and Coastal Access Act, 2009 was introduced. This landmark piece of legislation brings important new powers to Wales; the Welsh Government must take steps to ensure the Act is delivered quickly and effectively in Wales, otherwise Welsh seas will continue to suffer.

WWF Cymru is working with government, industry and other stakeholders to ensure the tools in the Marine Act are delivered effectively and decisively in Wales. We want to ensure that marine wildlife can once again thrive in Welsh waters.

How you can get involved

For further information about WWF Cymru and our marine work please go to *wwf.org.uk/wales*. You can find us on Facebook, *facebook.com/wwfcymruwales* and follow us on Twitter *@wwfcymru*

To become involved with WWF and our work, by becoming a campaigner or member, please go to wwf.org.uk

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Welsh seas

MARINE PROTECTED AREAS (MPAS)

MPAs are vital in protecting marine biodiversity; they also help safeguard vital ecosystem goods and services. WWF is calling for the better management of Welsh MPAs

15,000 SQ KM

At 15,000 sq km, Welsh seas are home to a vast array of habitats and species. However, they are under pressure and biodiversity is declining

MARINE CONSERVATION

WWF has been advocating the need for improved marine conservation in Wales for a number of years. Action is needed to improve and protect the health of Welsh seas

ECOSYSTEM APPROACH

It is vital to take an ecosystem approach to balance ecological, economic and social goals and objectives towards sustainable development

100% RECYCLED

WWF · HISTORICAL CHANGES IN WELSH SEAS: ECOSYSTEM TRENDS

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WWF

Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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