

OSPAR Commission
for the Protection of the Marine Environment
of the North-East Atlantic

Quality Status Report 2000
Region III Celtic Seas

Quality Status Report 2000
Region III – Celtic Seas

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FOREWORD

The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention 1992) requires that Contracting Parties shall 'take all possible steps to prevent and eliminate pollution and shall take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected'.

To provide a basis for such measures, the Contracting Parties are required to undertake and publish at regular intervals joint assessments of the quality status of the marine environment and of its development. These assessments should also evaluate the effectiveness of measures taken and planned for the protection of the marine environment and should identify priorities for action.

The Ministerial Meeting at which the OSPAR Convention was signed also issued an action plan for the OSPAR Commission, with a commitment to prepare a quality assessment of the whole maritime area by the year 2000. A comprehensive quality status report on this scale has not previously been produced.

To implement these commitments the OSPAR Commission decided, in 1994, to subdivide the maritime area into five regions and to prepare, coordinated by the Environmental Assessment and Monitoring Committee, five detailed quality status reports. As a result, five regional task teams were set up to produce reports for the following areas (see inset in **Figure 1.1**): Region I (Arctic Waters), Region II (Greater North Sea), Region III (The Celtic Seas), Region IV (Bay of Biscay and Iberian Coast) and Region V (Wider Atlantic). It was agreed that these reports should be developed in a scientifically sound manner and should be based upon an assessment plan and a scientific programme (covering monitoring, research and the use of assessment tools). It was also agreed that the information contained in the reports should reflect the outcome of the appropriate quality assurance procedures.

In 1995 the OSPAR Commission adopted a Joint Assessment and Monitoring Programme, to take over and build upon experience gained through its former Joint Monitoring Programme and the Monitoring Master Plan of the North Sea Task Force.

The findings of the five regional quality status reports ('the regional QSRs') form the basis of a holistic quality status report for the entire maritime area (the 'QSR 2000'). This regional report is thus part of an overall quality status assessment for the North-east Atlantic in the year 2000. The QSR 2000 will represent an integrated summary of the quality status of the entire OSPAR maritime area and will both fulfil the commitment made by the parties to the 1992 Convention and provide a basis upon which the future work programmes of the Commission can be decided. In the Sintra Statement, which concluded the 1998 Ministerial Meeting of the OSPAR Commission, importance was attached to the outcome of the QSR 2000 as a basis for identifying and prioritising future tasks at the Ministerial Meeting of the OSPAR Commission to be held in 2003.

The term 'OSPAR Commission' is used in this report to refer to both the OSPAR Commission and the former Oslo and Paris Commissions. The 1972 Oslo Convention and the 1974 Paris Convention were superseded by the 1992 OSPAR Convention when it entered into force on 25 March 1998.

The conclusions and recommendations contained in this report draw attention to problems and identify priorities for consideration within appropriate fora as a basis for further work. Within its sphere of competence, the OSPAR Commission will decide what follow up should be given to these conclusions, recommendations and priorities for action. The rights and obligations of the Contracting Parties are not therefore affected by this report.

THE PARTICIPANTS

Framework

The Environmental Monitoring and Assessment Committee (ASMO) has overall responsibility for the preparation of periodic quality status reports, assisted by a working group, the Assessment Coordination Group (ACG). ASMO outlined the basic arrangements for the quality status reports in the Joint Assessment and Monitoring Programme (JAMP). Further scientific and technical arrangements were prepared by ACG. Regional Task Teams (RTTs) were set-up for each of the regions of the maritime area. The lead countries for the respective RTTs were responsible for providing logistical support to the RTT.

Information relating to the entire maritime area was prepared in 1996 – 1998 by the following OSPAR working groups: the Working Group on Inputs to the Marine Environment (INPUT), the Working Group on Impacts on the Marine Environment (IMPACT), the Working Group on Concentrations, Trends and Effects of Substances in the Marine Environment (SIME) and its Ad Hoc Working Group on Monitoring (MON). This information constituted the basis of the five regional quality status reports, and was supplemented by relevant national information as appropriate.

Regional Task Team for the Celtic Seas

The RTT for the Celtic Seas had primary responsibility for drafting this report.

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OSPAR COMMISSION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE NORTH-EAST ATLANTIC

QUALITY STATUS REPORT 2000: REGION III – CELTIC SEAS

EXECUTIVE SUMMARY

Introduction

This report is one of five regional quality status reports prepared by the OSPAR Commission as part of its commitment to produce the first quality status report of the North-east Atlantic by the year 2000.

Region III, the Celtic Seas, extends between 60° N and 48° N and between 5° W and the west coast of Great Britain to the 200 m depth contour to the west of 6° W.

The report is based upon the most recent information available from national and international sources. The work was supervised throughout by a Regional Task Team, with members drawn from public authorities in Ireland and the United Kingdom.

Geography, hydrography and climate

The region contains wide variations in coastal topography, including fjordic sea lochs, rocky headlands, cliff formations, salt marshes, sand dunes, bays, estuaries and numerous sandy beaches. Region III also contains a number of internationally important ports and harbours.

Generally, water movement is from south to north, with oceanic water from the North Atlantic entering from the south and west of the region and moving north towards either the Arctic or North Sea. However, there are also complex intermediate water movements, particularly within the Irish Sea.

The sand transport pattern is complex, with a zone of divergence across the Irish Sea west of Anglesey and in the North Channel and a dominant westward trend out of the Bristol Channel and across the Celtic and Malin Seas.

The strongest winds in Region III come from the west and south, with a tendency for the strongest winds to be experienced in the north and west of the region. There are indications of an increase in the frequency and severity of storms.

It is estimated that if global warming continues, sea level in Region III could rise by between 15 and 95 cm within the twenty-first century, increasing the risk of flooding and coastal erosion in low-lying coastal areas.

Winter sea surface temperatures to the west and south of Ireland are several degrees warmer than those experienced in the comparatively shallow Irish Sea, because of its greater heat loss compared to the deeper Atlantic waters influenced by the North Atlantic Drift. However, in summer, shallower parts of the Irish Sea warm more quickly in response to the warmer summer air temperatures.

It is possible that decadal variability in climate over the North Atlantic might affect the region's hydrography.

Some estuaries and areas with restricted water circulation are under pressure as a result of high population density and industrial and/or port-related activities, for

example the Severn Estuary, Belfast Lough and the inner parts of Dublin Bay.

Human activities

The general pattern of population change in the coastal areas of Region III is one of declining numbers in the largest city centres, growing populations in the suburbs of major towns, steady increases in many industrialised counties and stable or declining populations in more rural and remote regions. There are seasonal variations in the population of many coastal resort towns. Two areas have shown particularly marked increases in population since the mid-1980s; the coastal counties of south-west England and the area to the north of Dublin City.

Region III has a large number and variety of habitats, many of which are listed for protection under international and national designations.

The current trend in tourism and recreation towards a diverse range of more individual pursuits (such as angling and surfing) on less developed parts of the coast can result in new pressures on natural habitats and water quality.

For 1990–5 the total average landings (excluding industrial fisheries) reported from Region III (all fleets) were 926 000 tonnes. Industrial fishery landings for fishmeal comprise only a small percentage of total landings.

Other human activities in the region which may impact on the marine environment include:

- mariculture (which has increased throughout the region in the last twenty years);
- sand and gravel extraction;
- dredging and dumping;
- oil and gas exploration and production (particularly in the area to the west of Shetland);
- shipping;
- coastal industry;
- military activities; and
- agriculture.

Chemistry

Inputs of contaminants to Region III can be broadly categorised as:

- direct (mainly discharges to coastal waters from industrial and municipal outfalls) and riverine inputs;
- dumping of wastes at sea (which includes munitions disposal, but excludes industrial waste which is no longer disposed of at sea in Region III and sewage sludge for which sea disposal has recently discontinued);
- atmospheric inputs (although with prevailing westerly winds, levels are relatively low compared with continental Europe);
- inputs from mariculture (faeces, excess food, chemotherapeutic agents and antifoulants); and

- inputs of oil (from shipping, oil and gas installations and discharges from rivers, industries and municipal wastewater facilities).

In general, loads of heavy metals from rivers and outfalls have been fairly stable during the 1990s, although there are indications that gross inputs of cadmium, mercury and zinc are slowly decreasing in some parts of the region. However, data show elevated concentrations of cadmium, mercury, lead and copper in sediments close to coastal sources. Concentrations in fish do not exceed national food safety standards. Mercury is the only element for which observed concentrations in Region III give cause for concern, primarily in Liverpool Bay and Morecambe Bay on the eastern side of the Irish Sea.

The report summarises information on the distribution of persistent organic contaminants in Region III, including various pesticides, industrial chemicals and by-products of combustion. Low, but detectable, concentrations of tributyltin (TBT) were found in livers of marine mammals. The main repositories of polychlorinated biphenyls (PCBs) in the marine environment are fine-textured sediments, but highest concentrations are found in fatty tissues of seabirds and marine mammals. Concentrations of polycyclic aromatic hydrocarbons (PAHs) varied throughout the region, although very high concentrations were found at some sites.

Discharges from Sellafield are the main source of artificial radionuclides to the region. For many radionuclides, current discharges are much lower than in the 1970s. Discharges of technetium-99 rose to a peak in 1995, although they have since declined. Small amounts of radioactivity are also released by other industrial, military and manufacturing installations on the west coast of Great Britain. All are subject to regular monitoring. The available data indicate that the incremental risks to human health from consumption of fish and shellfish from the Irish Sea are extremely small.

Concentrations of dissolved nutrients from sewage plants, some industries and the atmosphere exhibit a pronounced seasonal cycle in Region III. Although some areas become deoxygenated when algal blooms collapse and decompose in the summer, there is no consistent pattern which might be regarded as symptomatic of eutrophication in the open sea.

Biology

The large range of habitats in the region support a diverse fish fauna, including many commercially important species. Many of these species have relatively short migration routes between feeding and spawning areas. For some species there is evidence of recent changes in migration.

The region has a large number of areas attractive to seabirds and waterfowl. However, human activities can affect seabird numbers (e.g. by the loss or disturbance of habitats and by the ingestion of litter).

Some species of marine mammals (e.g. harbour porpoises) are believed to be at risk, as a result of the numbers caught accidentally by fishing. The common or

harbour seal and the grey seal are widely distributed throughout the region. The waters around Ireland and to the west of Scotland support a variety of cetaceans, but apart from the population of bottle-nose dolphins in Cardigan Bay, they are only occasionally seen in the Irish Sea.

In a number of shellfish harvesting areas, the implementation of the EC Bathing Water Directive has led to reductions in levels of microbiological contamination.

The introduction of non-indigenous species (either introduced intentionally or otherwise for mariculture, or through shipping) has caused some problems in the past.

Studies of imposex in dogwhelks around Ireland and the west coast of Great Britain show that ten years after the introduction of TBT restrictions, biological effects are still evident, although reducing.

Of 35 fish stocks assessed within Region III, the spawning stocks of thirteen are comparatively low. Of these, five stocks show a downward trend. The impact of fishing disturbance on benthic communities varies across the region.

Highest mortalities of maturing and adult fish occur in cod and whiting in all areas of Region III and in haddock in the Malin Sea. Celtic Sea herring is currently the most exploited pelagic stock, yet mortality among herring stocks appeared to stabilise at a relatively low level in the 1990s. Discards remain an issue and more sampling work is needed.

Past studies have linked fish diseases and environmental contamination. However, there are no indications of changing spatial or temporal trends in disease prevalence in fish populations in the Irish Sea.

Overall assessment

The assessment shows that Region III is generally in a good state of health. Ecosystem effects due to pollution are generally confined to urbanised estuaries. Measures taken to reduce risks include the ongoing provision and upgrading of sewage treatment plants for major coastal cities and towns, which is likely to produce a significant improvement in waters receiving such outfalls. Environmental levels of most contaminants routinely monitored appear either stable or decreasing. Apart from TBT, there is little evidence that present concentrations of these contaminants have been harmful to populations of marine biota.

However, several issues are highlighted as being of particular concern. These are fishing, endocrine disruption, coastal development and climate change.

- Stocks of several species, i.e. cod, hake, saithe, whiting, plaice and sole, are considered to be outside safe biological limits in parts of Region III. For several other species, e.g. skates and rays, the data do not allow an appropriate assessment. Monitoring of commercial species shows that seafood is of good quality and safe to eat.
- Endocrine disruption caused by TBT is a well established phenomenon in Region III. Although prohibition measures have been effective, TBT effects can still be seen where illegal use persists and around large ports (because TBT use is still permitted on hulls of large vessels).
- There is considerable pressure for more intensive use of coastal land.

- There is evidence of an increased frequency and severity of storms and an increase in temperature. If these increases continue, there will be implications for coastal defence and development.

Other issues which impact upon the region as a whole include:

- sewage;
- litter;
- microbiological contamination;
- mariculture;
- biotoxins;
- metallic contaminants;
- PAHs;
- oil spills;
- ballast waters; and
- ships on passage.

Other issues considered in the regional quality status report are:

- organochlorine pesticides;
- PCBs;
- eutrophication;
- deoxygenation;
- radioactivity;
- munitions;
- military activities;
- dredged materials;
- sand, gravel and maërl extraction; and
- offshore developments.

A number of gaps in current knowledge have been identified, these include:

- the effects of fishing on benthic species and marine mammals;
- the factors causing the development of toxin-producing species of algae;
- the risks of introducing non-indigenous species via ballast waters;
- data on fishing discards and landings;
- endocrine disruption in marine species; and
- data on the passage of ships carrying hazardous cargo.