

**COOPERATIVE RESEARCH REPORT ON THE EFFECTS OF  
MARINE AGGREGATE EXTRACTION ON FISHERIES**

**Note:** The Executive Summary only is reproduced here  
as it is intended that the full document will be printed  
shortly in the Cooperative Research Report series.

# **COOPERATIVE RESEARCH REPORT ON THE EFFECTS OF MARINE AGGREGATE EXTRACTION ON FISHERIES**

A report of the ICES Working Group on the Effects of Extraction of Marine Sediments on Fisheries

## **EXECUTIVE SUMMARY**

### **Background**

Aggregates are required principally for construction purposes, land reclamation and beach replenishment schemes. As acceptable land based sources are diminished so pressure is increasing in many ICES member countries for the demand to be supplemented from marine deposits. This in turn is leading to greater potential for conflict between the marine aggregate extraction industry and other users of ocean space and in particular the fishing industry.

The 'ICES Working Group on the Effects of Extraction of Marine Sediments on Fisheries' was convened in 1986 with the aim of increasing our knowledge and understanding of the impact of marine aggregate extraction activities upon fisheries in particular, and the marine environment generally, and to review management practices adopted by member countries to control such activities. Members of the Working Group have met regularly to exchange information on these matters; the following report is a synthesis of the information compiled by them.

### **Objectives**

The objectives of the 'Cooperative Research Report on Effects of Marine Aggregate Extraction on Fisheries' reflect those of the Working Group. They are to review:

1. marine aggregate extraction activities in the coastal and shelf environments of ICES member countries;
2. the effects of extraction activities on living resources and fisheries;
3. the management of aggregate extraction operations.

### **Progress**

Thirty four representatives from ten different ICES member countries contributed data enabling the compilation of this report, or assisted in its preparation. All material was reviewed by members of the Working Group.

### **Marine Aggregate Extraction**

The marine aggregate extraction industry is well established and growing in a number of ICES member countries, contributing up to 15% of some nations' demands for sand and gravel.

While the report notes advantages to marine aggregate extraction there are nonetheless a number of concerns relating to its implications for fishing, navigation, coastal protection and disruption of benthic ecosystems.

The principal uses of marine won aggregate are in construction projects, beach replenishment and land reclamation schemes and the creation of artificial islands.

### **Physical and Chemical Impacts**

Physical impacts of marine aggregate extraction arise from substrate removal and alteration of the bottom topography, creation in the water column of a turbidity plume, sediment redeposition from this and from screening. The nature of these impacts varies according to the dredging method, the magnitude and location (Section 3.1).

The physical impacts of trawling are similar in certain respects to those of dredging but in most areas affect a far greater proportion of the benthic environment (Section 3.5).

Chemical impacts of extraction are considered to be minor owing to the low organic and clay mineral content of extracted material (Section 3.2).

### **Environmental Impacts**

The biological impact of an extraction operation is largely dependant upon the nature of the physical impacts and of the indigenous benthic communities and so is very much site specific (Section 3.3).

Species considered to be potentially at risk as a result of marine aggregate extraction operations include sandeels, herring and edible crab but also coregonid and other bottom spawning fishes and maërl (Section 3.3).

An approach to determining the scale of the effects on marine life and fisheries as a consequence of aggregate extraction is outlined. Rough calculations for the North Sea suggest that, unless spawning grounds were to be disturbed, effects on fish stocks are likely to be negligible overall but there could be areas of local significance (Section 3.4).

Beneficial interactions of marine aggregate extraction operations may occasionally arise, such as the concentration of fish stocks over dredged pits (Section 4.2.2).

### **Licensing**

Most ICES member countries for which information is available have legislation and established review procedures for dealing with proposed aggregate extraction operations in the marine environment (Section 4.1.1).

Scientific considerations to be taken into account when issuing all extraction licences should include potential effects upon shoreline stability modelled where appropriate. The method of dredging, total quantity of aggregate to be extracted and the extraction rate should all be stipulated in the extraction licence as a means of controlling the potential impacts of the operation (Section 4.1.2).

A 'Code of Practice for the Extraction of Marine Minerals' is presented; it is designed to promote a good working relationship between the dredging industry and other ocean space users. Emphasis is placed on processing prospecting and extraction applications in a manner which minimizes the potential conflict between the dredging and fishing industries and optimizes the use of the marine resource (Annex 1).

### **Resource Mapping**

On the basis of available information seabed sediment mapping is progressing well in most ICES member countries; resource mapping programmes have been initiated by some countries but these generally lag behind those of seabed sediments (Section 4.2.1).

### **Monitoring**

The use of electronic monitoring devices aboard dredging vessels should be encouraged as these are advantageous to both the dredging company and the regulatory authority (Section 4.3.1).

Physical and biological monitoring of extraction operations can be of great value in the protection of the coastal and marine environments and of fisheries resources (Section 4.3.2 and 4.3.3).