

effects can be categorically regarded as due to pollution. It should be recognized that "from a strictly biological as well as a fisheries point of view it is the population and not the individual that is important and it is argued that unless an effect has consequences at the population level it is insignificant" (McIntyre et al., 1978). Whereas many biological monitoring

and it is argued that unless an effect has consequences at the population level it is insignificant" (McIntyre et al., 1978). Whereas many biological monitoring techniques are capable of suggesting effects of pollutants on populations, ecological monitoring addresses the effects directly. Furthermore, many biological monitoring techniques are rather inflexible, being committed to the near-shore and often intertidal areas, while ecological monitoring can cover all habitats from the intertidal zone to the deep sea. Ecological monitoring does, therefore, provide the early real time of effects on populations. However, early detection of changes on individuals, such as with genetic damage, is clearly preferable since effects on populations may not be shown for many generations.

OBJECTIVES OF BIOLOGICAL MONITORING

The effects of pollutants in populations and communities can be somewhat arbitrarily divided into acute and chronic effects. The detection of acute ef-

fects and show that North Atlantic planktonic species have cycles of up to 20 years. In benthic communities both individual components (Hily, 1979) and *Forostereira affinis* in the Baltic Sea (Lamy and Lohde, 1980) show cycles of at least up to 6-7 years. Indeed many monitoring programmes today are based on earlier projects not originally envisaged as monitoring programmes but subsequently continued because the data cover long time periods (e.g. C.F.P. programme). Ecological monitoring programmes aimed at assessing chronic effects of pollution must cover many decades. The division of monitoring into two distinct categories is not clear cut and no single set of criteria can be established for ecological monitoring. Rather local aims and objectives must be clearly defined and the appropriate spatial and temporal scale selected. The unravelling of effects of climatic changes on populations and communities can be greatly aided by small-scale international monitoring programmes. Under COST project 41 of the European Economic Community four different commissions, *Adverse/Pa-*

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