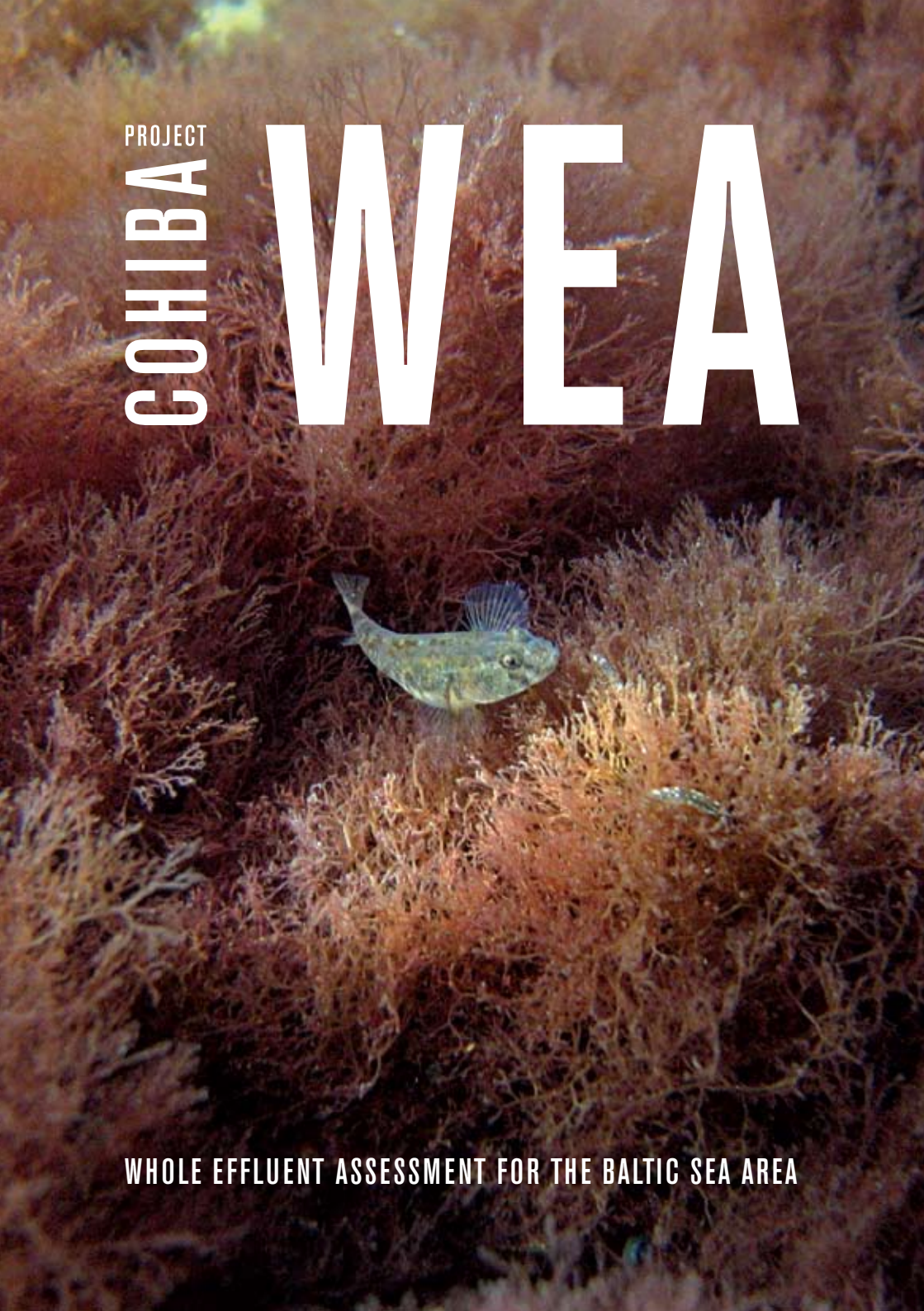

PROJECT COHIBA

WEA

WHOLE EFFLUENT ASSESSMENT FOR THE BALTIC SEA AREA

A NEW COST-EFFI

Whole effluent assessment (WEA) is a new, cost-efficient biological approach that can be used to assess the overall ecotoxicity of waste water effluents containing hazardous substances.

How have hazardous substances in waste waters previously been assessed and controlled?

Controls over waste water have mainly been based on conventional chemical analyses. This has involved identifying specific substances or substance groups and their concentrations in effluents, and setting concentration limits for individual chemicals. Analysing and controlling the overall toxicity of effluent has not previously been a common practice.

How does WEA differ from the conventional chemical approach?

Unlike the chemical approach, the WEA perspective does not require knowledge of the effluent composition and concentrations of specific substances. A WEA evaluates the overall ecotoxicity of an effluent. The basic principle is simple: WEAs measure the harmful ecological impacts of waste waters by directly exposing aquatic test organisms to whole effluent samples in controlled laboratory conditions.

Why is the chemical approach insufficient?

The Baltic Sea suffers considerably from contamination with hazardous substances. In spite of purposeful efforts to manage individual substances known to be problematic, its overall state has not improved. Approaches based on chemical analyses have shortcomings. Many effluents are complex cocktails of numerous chemical substances, including some that may be unidentified or poorly understood. It is impossible to identify all of the tens of thousands of substances that could be present in effluents or in the marine environment. It is also impossible to fully understand the effects of single substances and their combinations in the environment.

There is nevertheless a need to analyse and regulate discharges on the basis of their overall environmental effects. Such studies can also complement chemical analyses and improve our knowledge.

What are the benefits of WEAs?

The WEA approach provides a more comprehensive picture of the environmental impacts of effluent for management purposes than conventional data on chemical concentrations. WEAs can be seen as a link between chemistry and ecology, as they directly measure the effects of an effluent on the survival, growth and reproduction of organisms.

CIENT APPROACH

Whole effluent toxicity testing is also a less costly and more cost-effective method than conducting several advanced chemical measurements on effluent.

Why is biotesting cheaper?

A series of acute biotests can often be conducted for the same cost as the chemical analysis of a single hazardous substance. Crucially, biotesting gives a comprehensive picture of the harmfulness and environmental effects of a water sample on biota, while chemical analyses only usually provide information about the presence and concentrations of one chemical at a time. In any case, determining the presence of a specific substance in a sample cannot provide information about its harmful effects.

Is the WEA approach widely used?

- German legislation defines whole effluent toxicity limit values for several industrial sectors.
- In Lithuania, acute *Daphnia magna* test for effluents entering surface waters have been required by the Ministry of the Environment since 2006.
- Sweden and Denmark have defined non-statutory guidelines for the utilisation of WEAs in granting environmental permits to larger industrial plants.
- In Finland WEAs are not compulsory, and only applied occasionally in environmental permit procedures.
- Outside the Baltic Sea Region, the OSPAR Commission follows its own WEA Guidance Document, which was issued in 2007 after years of thorough investigations.

What is the aim of the COHIBA project regarding WEAs?

The COHIBA project (Control of hazardous substances in the Baltic Sea region) aims to develop innovative practices for evaluating the ecotoxicity of effluents by applying the WEA approach.

The project has already drafted recommendations on how to adopt whole effluent toxicity testing in controlling waste waters. These recommendations are based on the results of toxicity and ring tests carried out in the project, and on the experiences of project partners. The recommendations will be submitted to the Helsinki Commission. The project also aims to define toxicity-based discharge limits for effluents discharged into the Baltic Sea.

Draft recommendations on the COHIBA web site:
www.cohiba-project.net/identification/recommendations

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