

ABSTRACT PCDE 2003

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PORT DEVELOPMENT AND EU HABITATS DIRECTIVE

The paper discusses the relationship between ports near environmentally sensitive areas and the constraints imposed by EU environmental legislation, in particular the Habitats Directive.

Ports are important to industries : they create employment and revenues. More and more goods are transported over sea - through short-sea shipping - and by inland - waterways.

Ports are often situated at or near ecologically sensitive areas such as estuaries, deltas or lagoons. The legislation in the European Union that calls for special protection of fauna and flora (Habitats Directive and Birds Directive) has been developed without consideration of well-established economic activities. Especially if ports in the EU located in such areas seek further expansion and development they need to give detailed consideration to this legislation in an early stage of project planning.

The paper deals with the following aspects :

- Review of terminology for protected flora and fauna.
- Conservation, mitigation and compensation as alternative measures of compliance.
- The balance between economy and ecology and how to take this into consideration.
- Examples of compensation projects that “build” new habitats zones.

The conclusions and recommendations are formulated in light of the particular position of ports in EU accession countries. The conclusion highlights the fact that, even if the legislation is cumbersome, it is possible to respect it without undue cost impact.

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1. Introduction and Background

Environmental policy of the European Community was initiated in the 1970's.

The Birds Directive dates from 1979 (79/409/EEC) [1] and calls for special protection of rare birds under threat. This Directive has long been a 'lame duck'; the provisions of the Directive have largely been incorporated and enveloped by the Habitats Directive (92/46/EEC) [2] which had broader implications for the conservation of nature sites.

The overall goal of the policy concerning nature conservation in the European Union to date is "to halt the decline of biodiversity by 2010" [3].

Against this background the EU proposed to the Member States to develop an ecological network of specially designated sites across the territory. This initiative is called Natura 2000. It is a network of nature protection areas. It is comprised of special areas of conservation (SAC) designated by Member States under the Habitats Directive (1992) and of special protection areas (SPA) under the 1979 Birds Directive (see Box 1 for definition).

The Habitats Directive identifies some 200 types of habitats and 700 plant and animal species of Community importance and the Wild Birds Directive 181 vulnerable species requiring habitat protection through site protection.

This cannot be achieved by protecting isolated pockets of nature. Only by establishing a network of sites across the territory can Natura 2000 guarantee the conservation and protect biological diversity of these habitats and species.

Box 1

Directive 92/43/EEC : Conservation of natural habitats of wild fauna and flora

- ***Site of Community Importance (SCI)***

A site which, in the biogeographical region or regions to which it belongs, contributes significantly to the maintenance or restoration at a favourable conservation status of a natural habitat type or of a species listed and may also contribute significantly to the coherence of an ecological network and / or contribute significantly to the maintenance of biological diversity within the biogeographical region or regions concerned.

For animal species ranging over wide areas, Sites of Community Importance shall correspond to the places within the natural range of such species which present the physical or biological factors essential to their life and reproduction.

- ***Special Area of Conservation (SAC)***

A site of Community importance designated by the Member States through a statutory, administrative and / or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and / or the populations of the species for which the site is designated.

Directive 79/409/EEC : Conservation of wild birds

- ***Special Protection Area (SPA)***

An area designated as of particular importance for the protection of (birds) species as listed and thus deserving a special status and appropriate conservation measures.

The process of identifying special areas on the basis of scientific criteria is time consuming and is currently underway for Member States of the EU.

The procedure meets with a lot of resistance for a variety of reasons amongst which the following stand out :

- The administrative procedure is not very clear and may be interpreted differently in different countries;
- The scientific criteria in relation to specific sites are sometimes not clear, sometimes very difficult to verify with field observations;

- The designation of protected sites is the responsibility of Member States. Under the provisions of the Directive there are no provisions on how to deal with established rights of property and use, or with existing concessions.

In a number of cases the protection status has been given to areas previously designated for economic use. This results in conflicting requirements imposed on the habitat zone and may violate established user's rights.

2. Port development and Natura 2000

The concerns listed above tend to escalate in particular for designated conservation areas near ports. Ports are often situated at or near ecologically sensitive areas such as estuaries, deltas, lagoons or simply near a sensitive part of the coast.

If Natura 2000 sites are designated on the basis of scientific criteria this may well mean that areas designated for future port expansion are suddenly promoted to special conservation area. Any further port development suddenly becomes much more problematic (see below).

The potential for conflict in the use of designated areas is particularly apparent in and around estuaries and deltas. These valuable habitat zones are also home to (dredged) access channels and newly constructed port developments. The interpretation of what should constitute the protected area and what means protection in an estuary varies widely from one Member State to the next. This was made apparent in a study done by English Nature [4].

Part of the problem is presented by the fact that estuaries in particular are very dynamic ecosystems, where continuous change is the rule rather than the exception (tidal movements, moving sandbanks, changing salt marshes, tidal mudflats). What does "conservation" mean in the context of a dynamic ecosystem ?

Some Member States follow a narrow interpretation and only designate some areas of an estuary as conservation area; they tend to exclude all navigation and access channels to the port. Clearly port access requires a minimum allowable draught and the channels must usually be dredged frequently.

Other Member States define the total area of an estuary as conservation area, with the understanding that maintenance of navigational access is a normal procedure that does not adversely affect the natural habitat. Yet other Member States cut-off the conservation area at a certain depth and would state for example that all navigation channels below 10m depth are excluded from conservation status.

It may be clear that these interpretation differences create friction and irritation even though a certain amount of harmonisation is taking place.

3. The logic of the Habitat's Directive

While the Habitat's Directive deals with the provisions and criteria for site designation and conservation status, it recognises that other uses of a particular site or area may interfere with the intent of the Directive. To that end Article 6 has been formulated. This article is a key element and defines the provisions and procedure to follow in case of potential conflict in use (see Box 2).

Box 2

Directive 92/43 - Article 6

- “1. For special areas of conservation, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans, and appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in (Annex I) and the species in (Annex II) present on the sites.
2. Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.
3. Any plan or project not directly connected with or necessary to the management of the site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.
In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.
4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the member state shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.
Where the site concerned hosts a priority natural habitat type and / or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.”

Article 6 of the Habitats Directive provides a framework within which decisions about activities and development proposals which may affect Natura 2000 sites have to be made. This framework is often seen as effectively imposing a moratorium on developments within or adjacent to Special Protection Areas (SPAs) and Special Areas of Conservation (SACs).

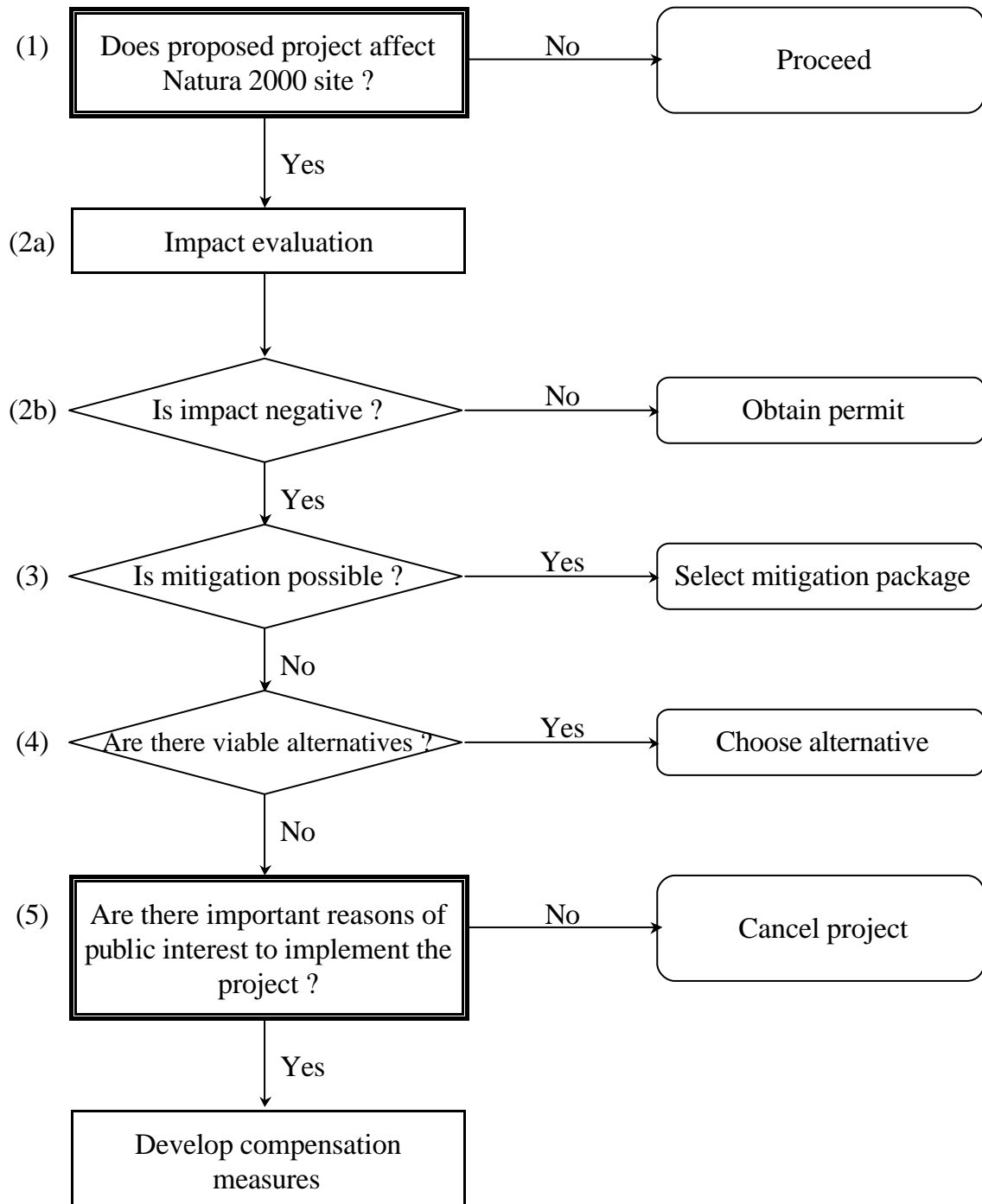
However, this is not the intent. Developments which do not adversely affect the integrity of a European site may proceed as normal. Even projects which do affect a site may be carried out so long as they meet a number of strict criteria - namely that there are no less damaging alternatives, that the importance of the project is such that it overrides the conservation importance of the site, and that adequate compensation is provided.

Fig. 1 illustrates the logic of Article 6 in simple terms. The discussion below corresponds to the numbering in Fig. 1.

- (1) The first step is a qualitative screening analysis that consists of a project description and an effect analysis. The potential concerns are :
 - Does the project take land from the conservation area ?
 - Is the project likely to have a negative quantitative and / or qualitative effect on the flora, fauna or bird population protected at this site ? There will be special attention for priority species.

This may then be assessed by considering expected interaction between the project and the conservation area :

- Distance to conservation site.
- Transmission of effects (noise, hydrology, morphology, water emissions, air emissions, construction activity).
- Indirect effects leading to loss of land (e.g. erosion, tidal window, etc.).

Fig. 1. : Simplified logic of Art. 6 of the Habitats Directive

- (2a) The type of impact evaluation depends on the size and nature of the project.

For large scale projects a formal Environmental Impact Study (EIS) as prescribed in Directive 85/337/EEC is required. Such an evaluation is complex and detailed and may easily lead to project delays since not all of the necessary information on species, on populations, on migratory movements etc. will be readily available.

For projects impacting a Natura 2000 site the evaluation must be done for each listed species of birds or fauna separately. Possible impact on rare flora is even more difficult to predict. The project developer will have to provide details, but the regulatory body may also commission impact studies.

- (2b) Once the possible impact has been assessed it is up to the competent authority to present a more specific or appropriate assessment. At this stage missing details may be required and any open questions need consideration. This is the phase where consultation of stakeholders should take place (local population, adjacent activities, environmental organisations, etc.).

In drawing conclusions about the impact it is important to clearly spell out the conservation objectives for a particular site. For example :

- For an estuarine site : to maintain the estuary dynamics and the associated flora and fauna on shore, in tidal range and underwater in favourable condition.
- For a healthy saltwater lagoon : to maintain the key species communities associated with this habitat in favourable condition by avoiding drastic change in water exchange and sediment balance.
- For a saltwater lagoon with poor water quality : to improve habitat conditions for key species by gradually improving the water quality while natural dynamics are respected until favourable conditions are reached.

- (3) Once the potential negative impacts have been identified possible mitigation measures may be investigated. These could for example consist of : - reducing emissions likely to have impact, - limiting (construction) work to certain periods, - provide physical barriers or buffer space between project and Natura 2000 site.

Another type of mitigation measure could be the surveying of sensitive parameters during project implementation or long-term monitoring of stability (or recovery) of the favourable conditions at the Natura 2000 site.

- (4) If one progresses through the decision logic to this stage it may be concluded that the negative project impact is significant and mitigation is insufficient. An assessment of possible alternative solutions is necessary.

Depending on the type of project, alternatives may be considered in time, in space or in approach :

- Time : Delaying or phased approach, construction under stringent conditions.
- Space : Select other location; split work differently (no single major port but two ports), use different access routes.
- Function : Focus on less damaging activities (e.g. container port versus petroleum port), demand management, switch transport mode.
- Implementation : Construction methods (e.g. silent piling), operational methods (e.g. limitation of dust in bulk terminal).

These should be examined by the competent authority and should be wide ranging.

- (5) If the previous steps have still not resolved concerns about impact on habitat, the last test is the question whether there are ‘Imperative Reasons of Overriding Public Interest’ (IROPI) to proceed with the project ? Unfortunately, it has not been clearly established how this check should be carried out. Ultimately it implies a balancing of economic and social considerations as driving factors for societal development against the significance of a particular type of habitat or species at a specific site.

It is regrettable that the Directive has not provided further guidance than the requirement that the importance for the public cause must be “overriding”. Limited complementary guidance is available in [5].

If the assessment would be made in terms of a cost-benefit evaluation, one needs shadow pricing for the value of natural habitat. In the literature suggestions have been made how one could establish such numbers, but it is clearly not an easy matter. Moreover, any assessment in economic terms is unlikely to meet with the approval of environmental groups.

In particular for port development projects there is usually a specific need to handle large volumes of goods and materials essential for the economy, while there are no real alternatives.

The authors submit that in most practical situations the real outcome of this decision-making process is taken at stage (4) where possible alternatives are considered.

4. Compensation projects around ports

A considerable number of possibilities exist to implement viable port development projects near Natura 2000 sites without having to consider some form of compensation. Nevertheless, Art. 6.4. of the Habitats Directive is particularly interesting in that it foresees the possibility of compensatory measures for projects needed for reasons of public interest.

Several projects have been proposed to provide such compensation for port development in or around estuaries. This may take the form of designating other valuable areas, of developing similar habitats at a suitable location, or even of “constructing” new habitat zones along the coastline or in the estuary or delta.

A selection of interesting examples is briefly reported on in the following in order to illustrate the concept and the potential of this solution. [6]

Box 3

The compensatory measures under Art. 6.4. can consist of:

- Recreating a habitat on a new or enlarged site, to be incorporated into Natura 2000.*
- Improving a habitat on part of the site or on another Natura 2000 site, proportional to the loss due to the project.*
- In exceptional cases, proposing a new site under the Habitats Directive.*

4.1. Bremerhaven

The continuing expansion of the port of Bremerhaven lead to the need for new container terminals. The studies that resulted in approval of a construction project in 1994 started in the early 90's. The project would be constructed on land that is for the most part protected under nature conservation law.

The expected impact was assessed to include the loss of inundated river banks, tidal flats and brackish water reedbeds, ponds, open sand with pioneer vegetation, saltmarsh, low intensity farmed grassland, a high tide roost, breeding and foraging grounds for birds, and sites of Bulbous Foxtail *Alopecurus bulbosus* (a grass species confined in Central Europe to the We ser estuary).

The area was predicted to lose its regional importance for breeding birds (9 species listed in the Red Data Book) and its national importance for migrants (Ringed Plover).

Negative effects were also anticipated on the benthic fauna of the Outer Weser, following dumping and dredging activities.

Compensation scheme

The competent authorities issued the construction permit for CT III in 1994 and obliged the port authority to implement various compensation measures. Functions and values had to be re-established as close as possible, both ecologically and geographically.

The creation or improvement of 348 hectares was designated to compensate for the loss of 111 hectares. Five areas were selected to be developed with regard to impact-related and site-specific compensation goals :

- Wedderwarden Foreland, North of Bremerhaven was to improve its function as a breeding and roosting site for birds and also as foraging grounds on the intertidal mudflats.
- South of the city a high tide roost was planned on a former spoil deposit near Neues Lunesiel.
- Two areas were designated to substitute loss of marshes, sandy and ruderal areas (north of Erdmannssiel and on Luneplate)
- Tegeler Plate is the area chosen to achieve the most ambitious objective : to re-establish natural and semi-natural brackish water habitats under tidal influence. Important practical measures included removing sections of a summerdike and excavating (tidal) gullies and ponds.

Preliminary results

Regular scientific research and annual reports indicate the progress of the compensation measures. After basic structures and habitat creation had been accomplished, habitats as well as species composition and abundance moved in the expected direction.

Important features also included the reduction of agricultural and recreational activities. Wet grassland developed and could be managed, e.g. for diversified vegetation and breeding meadow birds. Most important, tidal dynamics returned to a former summer polder.

Morphological and hydrological conditions changed and allowed halophilous aquatic and terrestrial species to move in. New functions, such as moulting and roosting places for birds, were established. Due to natural succession, reed-beds increased and replaced intensively farmed land.

But the project had limitations too. For example, an area proposed as a high tide roost for waders was soon covered by reed. Aiming for the original target was considered unrealistic, so it was agreed to preserve the current status. The export and introduction of Bulbous Foxtail to new places also did not prove successful immediately and had to be attempted at other sites.

However, by 1997, the areas used for dredging and dumping were already regarded not to have suffered sustained impacts compared with the “status quo ante” in 1994.

4.2. Harwich Haven

The Harwich Haven approach channel provides access to the Stour / Orwell estuary and the port of Felixstowe. Due to growing container traffic the channel was deepened in 1998 by 2m to -14.5m. The intertidal parts of the estuary are designated as Special Protection Area under the Birds Directive.

Project impact

Extensive coastal process modelling studies, undertaken as part of the environmental impact assessment, concluded that the dredging (of some 17 million m³ of material) would lead to the conversion of 4 hectares of intertidal habitat within the Special Protection Area to subtidal habitat.

This loss, comprising a narrow strip of intertidal habitat (cm wide) but around much of the estuary, would result from a reduction in the tidal range. Following the dredge, it was predicted that the very lowest part of the intertidal area would no longer be exposed at low water.

In addition to this direct and immediate loss, the increased sediment “sink” provided by the deeper channel was identified as likely to further reduce sediment supply to the foreshore, in what is already a highly erosive system. Modelling estimated that this would lead to a loss of around 2.5 hectares of intertidal area every year, due to increased erosion.

Compensation

The conservation agencies agreed on a scheme to provide 4 ha of new intertidal mudflats and 12.5 ha of new intertidal habitat as a precautionary measures for future losses. This was realised by a process of managed retreat (by inundating agricultural land).

In addition, dredged material from maintenance dredging is reintroduced into the estuary by placing it in shallower areas and thus “feeding” the mudflats. This appears to be a highly successful technique.

The results thus far indicate that colonisation in the newly created intertidal range is quite successful.

4.3. Le Havre

The Port Autonome du Havre is situated on the mouth of the Seine estuary. Plans for massive port expansion started in 1994. Initially the port expansion was foreseen to be compensated by identifying a large new SPA. This did however not foresee in compensation of valuable habitat zones that would disappear due to port construction. The scheme was rejected by the European Commission.

French authorities subsequently decided to develop an integral ecological management plan for the estuary. This integrated approach was developed for the estuary and resulted in the development of compensatory measures in the perspective of Art. 6.4. of the Habitats Directive as far as port extension is concerned.

An agreement was concluded with the European Commission on the ideal site for the birds, its preservation and protection through legal measures. Furthermore, the restoration measures for the estuary are now placed under the supervision of a Scientific Committee.

4.4. Ecological engineering operations / Compensation development

The total restoration scheme went far beyond the impact of the port development. The scheme includes compensation measures and ecological restoration.

- **Mudflat restoration**

The dissymmetry of the tidal currents and the action of the swell means that the estuary tends to fill with sediment (mud and sand), essentially marine in origin. These deposits of sediment are currently estimated at about 3 million m³ per year (those of a river origin amount to about 0.6 million m³ per year on average). Their main effect is that they shift the whole mouth of the estuary downstream at a speed estimated at 50 m per year for the last 20 years, and they also cause the sedimentation of the mudflats.

Additionally, the kinetic energy generated by swells and currents prevents the mud from settling. Because of this the remaining surface of the mudflats is no more than some 300 ha and decreases by about 25 ha each year.

The criteria taken into account for the selection of the most favourable potential sites for the creation of intertidal mudflats are : the abundant production of benthic fauna and flora accessible to birds and fish; the speed of succession to land because of vegetation growth, the position and function of the mudflats in an ecosystem; and, the cohesion of their management with other types of environment.

- **New resting areas for birds**

The creation of a swinging area as part of the quay meant that about 30 ha of Special Protection Area was destroyed. In order to compensate for this resting place for birds, four hunting pools have been changed into a large resting area (about 40 ha) with a nesting island in the middle.

One or three small artificial islands will also be built in the mouth of the river Seine. As shown by experiments with natural and artificial islands in other parts of the world, this small island will provide a particularly suitable site for sea birds and possibly marine mammals.

- ***The creation of a 70 ha conservation area***

Numerous amphibians and birds along with various species of protected orchids, including the very rare *Liparis Loeselii*, were spared as the planned roads were moved considerably further northwards. The area became classified as a 'voluntary nature reserve'.

The "construction" is currently underway and is very promising. Thanks to the comprehensive approach including model testing and engineered design work, all is provided so that human-induced nature development can at the same time provide port development and the rehabilitation of the Seine estuary.

5. Conclusions

- The EU Habitats and Birds Directives can have a very significant impact on nature conservation and on development plans.
- The approach prescribed by the Directives provides for a spectrum of possible solutions and alternatives, including the creation of compensation.
- Port development projects in particular face major problems as a result of the presence of protected areas in the vicinity.
- Valuable habitat sites can be created thanks to planned human intervention. Important expertise has been developed by the ports and dredging industries in Western Europe.
- Compensation projects are not cheap ! Experience thus far indicates costs between 10 and 20% of the total (port development) project.

6. Recommendations

- For EU accession countries it is important to anticipate future impact of the Directives. This may be done by identifying possible sites for conservation and protection in an early stage.
- The selection of such sites as well as their boundaries should anticipate possible future developments (coastal, ports, urban, etc.) and attempt to avoid overlap or interaction with established user rights.
- Above all, the accession countries should insist on clear guidance in implementing Directives (responsibilities, role of Commission versus Member States, transparency in decision-making). This will help to avoid a great deal of unnecessary expense. Learn from experience by others !

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