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Maintenance of the favourable conservation status in two Special Protection Areas in co-habitation with development of the Antwerp harbour

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Abstract

The growing Antwerp harbour on the left bank of the River Schelde has a considerable overlap with designated Birds and Habitats Directive areas (SPA and SAC). Harbour development projects threaten the favourable conservation status of the protected habitats and species. On the other hand the international conservation commitment hampers the harbour development. 'Co-habitation', the aim of the Flemish Government to maintain a balance between industrial and ecological needs is a key word in the present-day management of the region. The Deurganckdock case exemplifies possible problems and solutions for Natura 2000 in harbour development areas. Compliance with article 6 of the Habitats directive is the most complex issue. In this case it failed with respect to the assessment of adverse effects and several aspects of the compensation policy. Well defined conservation objectives and performance criteria are essential to the process and should be defined as soon as possible for any Natura 2000 site. Habitat creation/development as compensatory measure should start prior to and not simultaneously or after habitat destruction. Temporary compensations are no sustainable solutions and are only acceptable when an existing habitat is involved; temporary habitat creation is both an economic and ecological loss. Monitoring Natura 2000 sites is essential to successful adaptive management and the maintenance of a favourable conservation status, especially in highly dynamic areas such as harbour development areas.

Keywords: Natura 2000; Favourable conservation status; Harbour development; Co-habitation; Compensation.

Introduction

The growing Antwerp harbour on the left bank of the River Schelde has a considerable overlap with the Birds and Habitats Directive areas 'Schorren en polders van de Beneden-Schelde'(SPA) and 'Schelde- en Durme estuarium van de Nederlandse grens tot Gent' (SAC). Harbour development projects are continuously potential threats to the favourable conservation status of the protected habitats and species. On the other hand the international conservation commitment laid on these sites hampers the economic

expansion of the harbour. A key word in the management of this region is 'co-habitation', the aim of the Flemish Government to maintain a balance between both industrial and ecological needs.

With the construction of the Deurganckdock the reciprocal pressure led to a conflict situation. Construction works had to be interrupted following a complaint from the EC because Article 6 of the Habitats directive was not well complied with. The EC commented that the alternative selection was erroneously guided by economic motives rather than Natura 2000 values, that the overriding public interest was not convincing, that compensation measures should be a very last resort, like for like and effective prior to habitat destruction. The principal complaints were the lack of a proper assessment of the adverse effects on the protected habitats and species with specific reference to conservation goals and objectives, including cumulative effects with previous developments and of a well substantiated 'like for like' nature compensation plan, integrated in the cost-benefit analysis and time-table of the construction project.

In response a new environmental impact assessment (EIA Linkerscheldeoever – Deurganckdock 2001) was compiled, taking into account cumulative effects with previous projects. It includes a substantiated compensation plan which is linked in time to the Deurganckdock construction works: each compensation measure is linked to a specified aspect of the Deurganckdock works in a 'compensation matrix'. In the absence of specific conservation objectives, every adverse effect was considered as significant and was to be compensated for.

The compensation matrix is an important tool for the management committee which was installed to coordinate and control the nature compensation works and to report on its progress to the EC. Parallel to the planning and development process, a long-term monitoring program is set up to evaluate the effectiveness of the compensation measures and the evolution of the conservation status of the special protection areas in the harbour. The monitoring results are an input for the management committee's annual report to the EC and are an important aid for the adaptive management of the area.

The Compensation Matrix

The completion and exploitation of the Deurganckdock are linked to the realisation of specified compensation measures. The Compensation Matrix (Table I) contains all the information needed for the planning of the process. In the EIA the loss of each habitat type and the need for compensation were quantified; potential zones for compensation were proposed. The matrix contains information on the required habitat types, the surface area needed, potential localities for their creation, the Deurganckdock construction permit it is linked to and the responsible authorities for implementation and financing. In chronological order four different tasks are determined: acquisition of land, acquiring permits, development of the habitats and conservation of the area. The principle of contemporarity prevails: Deurganckdock construction permits can only be granted if the works for the corresponding compensation measures are started simultaneously with the start of the works granted by the corresponding construction permit. Simultaneously with the loss of a habitat type, creation of the same type has to

start in a compensation zone. The matrix makes a distinction between permanent and temporary compensation zones. Temporary compensation zones are undeveloped areas with a future economic destination. They can develop into specific habitat types until they will be claimed for harbour development, whereupon another nature compensation zone will have to be developed in exchange.

Table I. Simplified version of the Compensation Matrix for the Deurganckdock

Habitat type	Surface needed (ha)	No. of potential zones	Total surface of potential zones (ha)	Type of compensation (ha)
Bare sandplanes with water	200	3	204	temporary
Reedland and water	25	2	27.8	17.8 temporary 10 permanent
Tidal mudflats and marshes, shallow water	25	2	50.5	permanent
Meadows	250	3	273	221 permanent 52 temporary
Deep water with natural shores	35	2	116.7	80 temporary 36.7 permanent
Polder with high ecological value	45	large perimeter	undet.	temporary

A specific section of the Matrix (Table II) deals with historical, uncompensated habitat losses due to harbour development activities (phase I of the Verrebroekdok). For ‘reedland and water’ existing habitat within the perimeter of the harbour was permanently changed from industrial area to nature reserve. ‘Mudflats, tidal marshes and shallow water’ will be realised in the polders of Kruibeke-Bazel-Rupelmonde, where 50% of Flanders biggest flood control area will be subjected to a controlled and reduced tidal regime.

Table II. Simplified version of the Compensation Matrix for historical losses

Habitat type	No. of potential zones	Total surface of potential zones (ha)	Type of compensation (ha)
Reedland and water	2	101.5 + 82.4	permanent
Tidal mudflats and marshes, shallow water	1	300	permanent

Conservation goals and objectives

Quantified and well defined conservation goals for species and habitats, in accordance with the Habitats Directive art. 6(1), are an essential asset to good management and land use planning in Natura 2000 sites, especially in very dynamically evolving environments like the Antwerp harbour region, where several actors (harbour authorities, industry, agriculture, nature, …) claim the land. Such objectives did not exist for the study area and were recently set. In a study by the University of Antwerp, commissioned by the Administration for Nature of the Flemish government (AMINAL, section Nature) (Van Hove *et al.*, 2004) conservation goals for the Birds and Habitats Directive were integrated for the port of Antwerp and defined in terms of required surface area for each type of habitat.

A list of bird species of special interest was set, following several criteria such as Annex I of the Birds Directive, the Ramsar international 1% standard for migrating water birds, the Flemish Red list for breeding birds and the 5% level of the Flemish breeding population. For each species of special interest the minimum required population size was set. In combination with the species' habitat needs and its population densities in the specific habitat types these target numbers were translated into target surface areas of different habitat types. These were integrated with the habitat conservation objectives for the Habitats Directive.

Theoretically a minimum required population should be based upon a minimum viable population size, calculated from a population ecological approach, but for most species good knowledge on life history parameters is lacking. Moreover local populations should be considered as a functional part of the metapopulation and do not always need to be sustainable by themselves. As an alternative strategy minimum required populations were calculated based on historical time series for the region.

For waterbirds a systematic counting program existed, but for breeding birds no systematic long-term monitoring program has been run in the past. Only data from volunteers were available. The quality of such information can differ much from region to region, depending on the local observers. Sometimes very good and detailed information is gathered, but in other cases time series are more or less biased by the observers interest, focussing on rarer species or areas with high densities. Nevertheless

this type of information is of crucial importance as a guideline for expert judgement if interpreted with caution. International literature was a first input for the translation of bird number into habitat surface areas. However, this is not always the most appropriate method because of the high regional variability in specific bird densities and the influence of habitat quality and characteristics. Field data from comparable nearby regions are an important additional input source. Since the monitoring program of the Antwerp left bank harbour region had been started in the meantime, the present field data could be used for comparison.

As a next step the conservation objectives for the different habitat types serve as an input to design different scenarios for Natura 2000 in the regional planning.

Monitoring

At the end of 2002 a systematic monitoring program for compensation works on the Antwerp left bank harbour region was started by the Institute of Nature Conservation, commissioned by the Flemish government (AMINAL, section Nature). The main goal of this monitoring program is to gather data to evaluate the effectiveness of the compensation measures for the Deurganckdock and the general management of the Natura 2000 network in the harbour. The program includes census of breeding, migrating and wintering birds of special interest, according to the criteria which were set in the conservation objectives, availability and quality of habitat types of special interest and hydrology of the region. In addition, some other animal groups are monitored for their indicator value (specific insect groups) or because they are listed as Annex IV species in the Habitats directive (Natterjack toad and bats).

The ultimate goal is to get a complete picture on the evolution of the conservation status of the special protection areas. With the monitoring results deviations from the conservation objectives can become apparent and the management can be adjusted accordingly. It can also reveal slow but steady and continuous deteriorations of the SPA, *e.g.* due to changing agricultural practices.

Another important advantage of the monitoring program is the generation of data, needed for environmental impact assessments and/or appropriate assessments in compliance with article 6(3) of the Habitats directive for infrastructure projects and changes in land use.

Assessments of the favourable conservation status, the impact of harbour development projects and the mitigating effects of compensation measures can only be reliable if they were based on long enough time series, hence the importance of long term monitoring programs.

The Institute of Nature conservation, is responsible for the monitoring program, but it works as much as possible in cooperation with the local nature conservation association ‘Natuurpunt WAL’. Monitoring is very time consuming, all extra information from volunteers can be very helpful and essential to appropriate evaluation. Moreover volunteers are very familiar with the area, have profound knowledge of its history and

are very motivated. On the other hand they often don't use standardised methods or lack the time or scientific background. Good cooperation and agreements between professionals and volunteers are very important to optimise the quality and comparability of the results. In this monitoring plan all inland waterbird counts are organised by the volunteers while they only participate for a small part in the breeding bird census as this is far more time consuming. Additionally volunteer involvement is an important asset to the societal base for nature conservation policies .

Results and discussion

The first year's results (2003) revealed a problematic situation for breeding birds which rely on one of the three specified habitat types: bare sandplanes with water, meadows in the polder with high ecological value and deep water with natural shores (*cf.* Table I) (Spanoghe *et al.*, 2003). The breeding numbers for almost all of these species were below the stated target numbers in the conservation objectives (*cf.* Table III). Species like Avocet, Redshank, Black-tailed Godwit, plovers and Shoveler revealed the greatest decline in comparison to previously known records. This was clearly related to substantial losses of these habitats in the developing zone. In 2003 these species could not settle in permanent compensation zones; these were still under planning or construction. In the meantime there was a gap in the habitat balance and consequently breeding bird numbers decreased. The necessary works were started in accordance with the compensation matrix, but as long as they have not been finished the habitat needs will not be fulfilled. Moreover the development to full functional habitat can take several years. The simultaneous creation of habitats parallel to the infrastructure works will always cause a dip in the populations for a number of years. Therefore compensation measures should be taken in advance. This proactive way of working is now embedded in the future strategic planning process for the Antwerp harbour, when conservation objectives will be translated into spatial scenarios.

The importance of the temporary compensation zones in the study area was dual. Temporary compensation zones that already existed as appropriate habitat, accommodating already important numbers of breeding birds and where only some management actions such as reduction of accessibility were needed, were successful. However, temporary compensation zones where the appropriate habitat type was still to be created were generally unsuccessful. The habitats were not yet functional and did not meet the required quality, or development works were simply not finished, due to time loss for the finalisation of the development plans and the acquisition of legal permits. In general habitat creation for temporary compensation is probably not very cost-effective because the habitats will hardly be fully functional before they will be destroyed to fill in their final destination (Fig. 1).

Fig. 1. Left: Target habitat type wet meadows (photo F. Piesschaert). Right: Farmland that has to be converted into wet meadow by excavation. According to the matrix this compensation measure is temporary, since the area is foreseen for further harbour expansion.

Table III. Numbers of some breeding birds in the SPA Left bank compared to the Conservation Objectives (Van Hove *et al.*, 2004)

Habitat type	Conservation objectives (Van Hove *et al.*, 2004)	2001	2003
Black-tailed Godwit	80-100	84	32-39
Redshank	100-130	138	58-59
Avocet	350-450	447	70-100
Shoveler	100	109	App. 31
Little Ringed Plover	50-60	45	13
Ringed Plover	4-5	5	1

Conclusions

Conservation objectives for species and habitats of special interest are essential assets to the maintenance of the favourable conservation status of Natura 2000 sites. They should be considered in the process of regional planning and land use.

Compensatory habitat should be created and be functional prior to and not simultaneously with habitat destruction.

Temporary habitat compensation is not sustainable and should be avoided.

To avoid unnecessary delays the necessity of compensation projects and their planning should be included in the planning process, the environmental impact assessment and cost-benefit analysis of the development projects.

Long term monitoring results are essential to set conservation objectives, to assess the favourable state of conservation of the site, to evaluate its management, for appropriate

assessments of planned projects, to plan compensation measures if necessary and to evaluate their effectiveness. For optimisation monitoring programs should as much as possible be set up as a cooperation between professionals and volunteers.

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