



# Indicators for the Scheldt estuary

## Protection and development of natural areas



The area of legally protected valuable habitats and landscapes in the Scheldt Estuary revealed an exponential increase in the last 70 years from 167 ha protected area in 1939 to 92,588 ha in 2009. In the framework of the updated Sigma Plan, over 5,300 ha of new nature reserve will be developed along the Zeescheldevally by 2025. In addition, at least 600 ha of new estuarine nature will be realized in the context of the Westerschelde Nature Plan (natuurpakket Westerschelde).

### Why monitor this indicator?

During the past century, both the Zeeschelde and Westerschelde experienced major changes in terms of morphology (shape / structure of the riverbed) and dynamics. Large areas of ecologically important living environments or ecotopes, such as low dynamic mud flats, salt marshes and shallow water areas, have disappeared (see indicator 'preservation of morphology and dynamics'). The Long-term Vision of the Scheldt Estuary (LTV, [1]) aims at a healthy and dynamic estuarine ecosystem in 2030: 'As one of the most important estuaries in Europe with a full tidal regime and a complete salinity gradient, the estuarine ecosystem, with its typical habitats and communities along the salinity gradient, should be preserved and even enhanced where possible.'

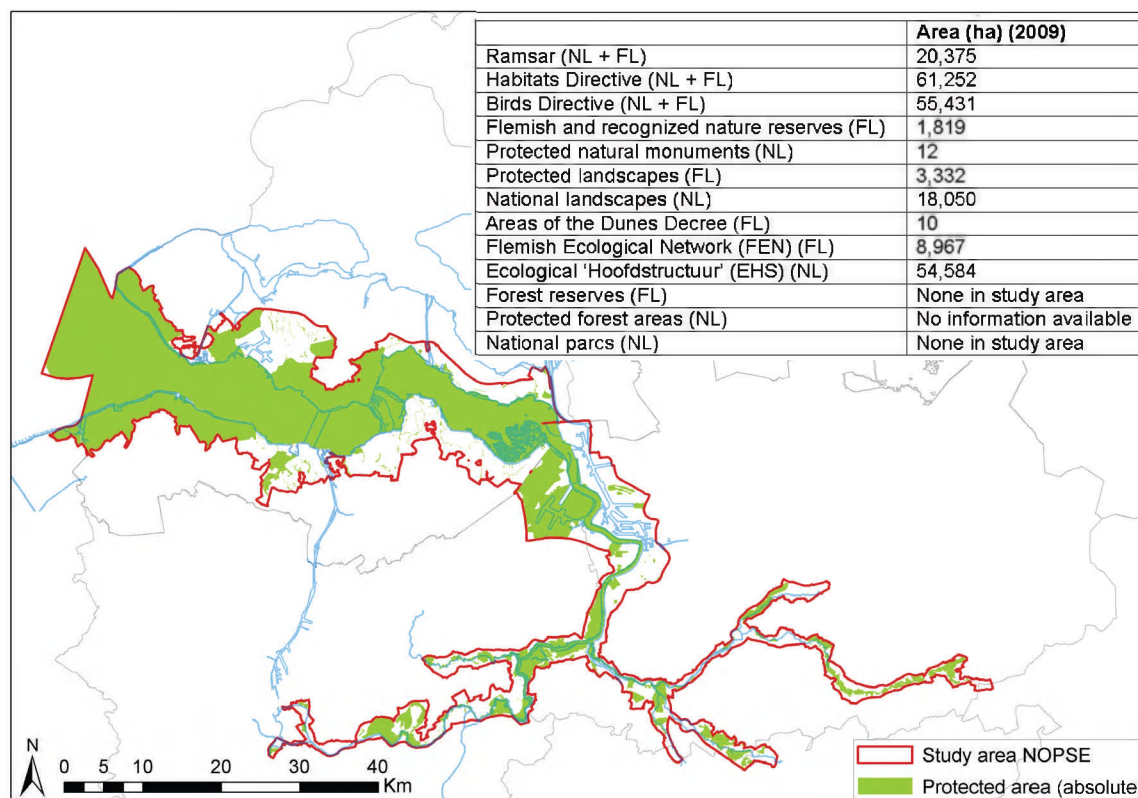
The legal protection of valuable habitats and landscapes is part of the policy measures which were taken for the maintenance and, where possible, the enhancement of the natural ecosystems. In the 'Ontwikkelingsschets 2010' (outlines for development) of the Scheldt Estuary [2] further concrete actions and projects are defined to achieve the goals of the LTV by 2030. Different measures for the Zeeschelde have to be taken in the framework of the updated Sigma Plan [3] to create a natural and safe estuary. Safety aspects are discussed in detail in the indicator 'safety against flooding'. In the updated Sigma Plan, various aspects of nature development are elaborated. The Flood Control Areas (FCA's), which are created, can have an exclusive water storage function or may be used for agricultural purposes. During flooding, a certain volume of water is temporarily stored in a FCA in order to lower the water level of the river. One may choose to give these FCA's an exclusive nature function (both tidal and non tidal bound) or an interwoven nature-agricultural function. In the Controlled Reduced Tide area (FCA-CRT) the daily tidal influence is reduced and ecosystems may develop which are adapted to flooding (estuarine nature). In addition, in the framework of the updated Sigma Plan tide-related (reclamations) and non tide-related (wetlands) natural areas are created without having water storage as primary function. The Netherlands aims to restore and preserve the natural physical, chemical and ecological processes along the Westerschelde with a spatial extension of the estuary in the context of the Westerschelde Nature Plan (natuurpakket Westerschelde) [4].

## What does the indicator show?

### *The area of protected designations in the Scheldt Estuary*

The Netherlands and Flanders each have different designations for the protection of natural areas. The Netherlands takes into account the following legal statutes to protect natural areas: Wetlands or Ramsar sites (Ramsar international convention), Natura 2000 areas (European Habitats and Birds Directives, translated into the Nature protection law), Protected natural monuments, National parks, National landscapes and the Ecological 'Hoofdstructuur' (EHS, the structural ecological network). In Flanders, the following designations can be distinguished: Wetlands or Ramsar sites, Natura 2000 area (European Habitats and Birds Directive, translated into the Decree for nature conservation), Flemish and recognized nature reserves, Forest reserves, Areas of the Dunes Decree, Protected landscapes and the Flemish Ecological Network (FEN). A comprehensive analysis and comparison of the 'local' Dutch and Flemish designations for protected areas did not yet take place. However, there is a large overlap as some areas belong to two or more legal designations. For example, the Natura 2000 areas in the Netherlands are often also part of the Ecological 'Hoofdstructuur' (EHS) and nature reserves in Flanders are frequently also included in the Flemish Ecological Network.

92,588 ha, which represent more than 60% of the total area defined under the Nature Development Plan for the Scheldt Estuary (NOPSE, [5]) and extended with the 'Zwin', was in 2009 protected by at least one legal status (see Figure 1).

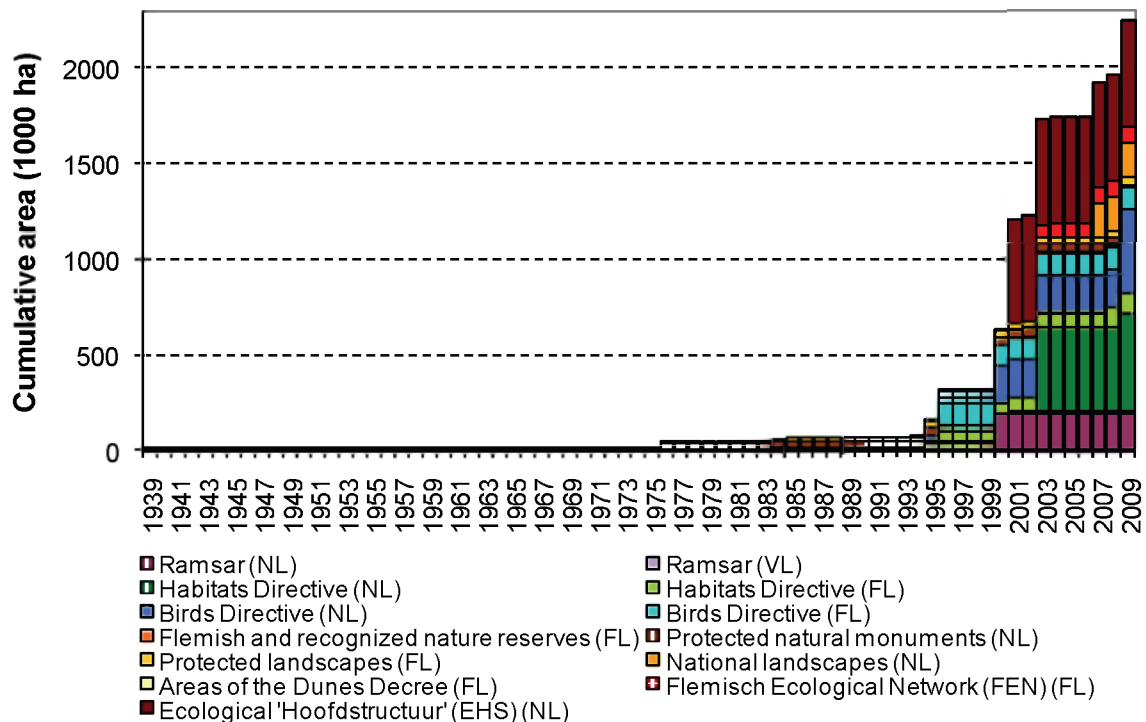


**Figure 1:** The absolute or non-cumulative area of (inter)national protected statutory designations in the Scheldt Estuary (study area of the Nature Development Plan for the Scheldt Estuary NOPSE, extended by the 'Zwin'), 2009 situation. The table displays the area by statutory designation. Certain statutes give rise to an overlap in protected area. Hence, the sum of the areas in the table is higher than the area delineated on the map. Source: The Agency for Nature and Forest (ANB), the Flemish Agency for Spatial Planning and Heritage (R-O Vlaanderen), Government Service for Land and Water Management (DLG), Research Institute for Nature and Forest (INBO), Ministry of Agriculture, Nature and Food Quality (LNV), Ministry of Housing, Spatial Planning and the Environment (VROM), Province of Zeeland.



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The legal protection of natural areas and landscapes in the Scheldt Estuary experienced an exponential increase in the last 20 years (Figure 2). Already in 1939, a part of the Flemish 'Zwin' was recognized as a protected area by Royal Decree, constituting an area of 167 ha, located in the present study area. Gradually, more protection statutes were created which increased the cumulative protected area to about 224,000 ha in 2009. The cumulative area of protected designations is greater than the effective non-cumulative or absolute protected area, as a result of the overlap of some protection statutes. The areas protected by the Habitats and Birds Directives in the Scheldt Estuary represented 52% of the total cumulative area in 2009. The Dutch EHS, protecting an area of 55,000 ha, also represents an important protection statute in the Scheldt Estuary.



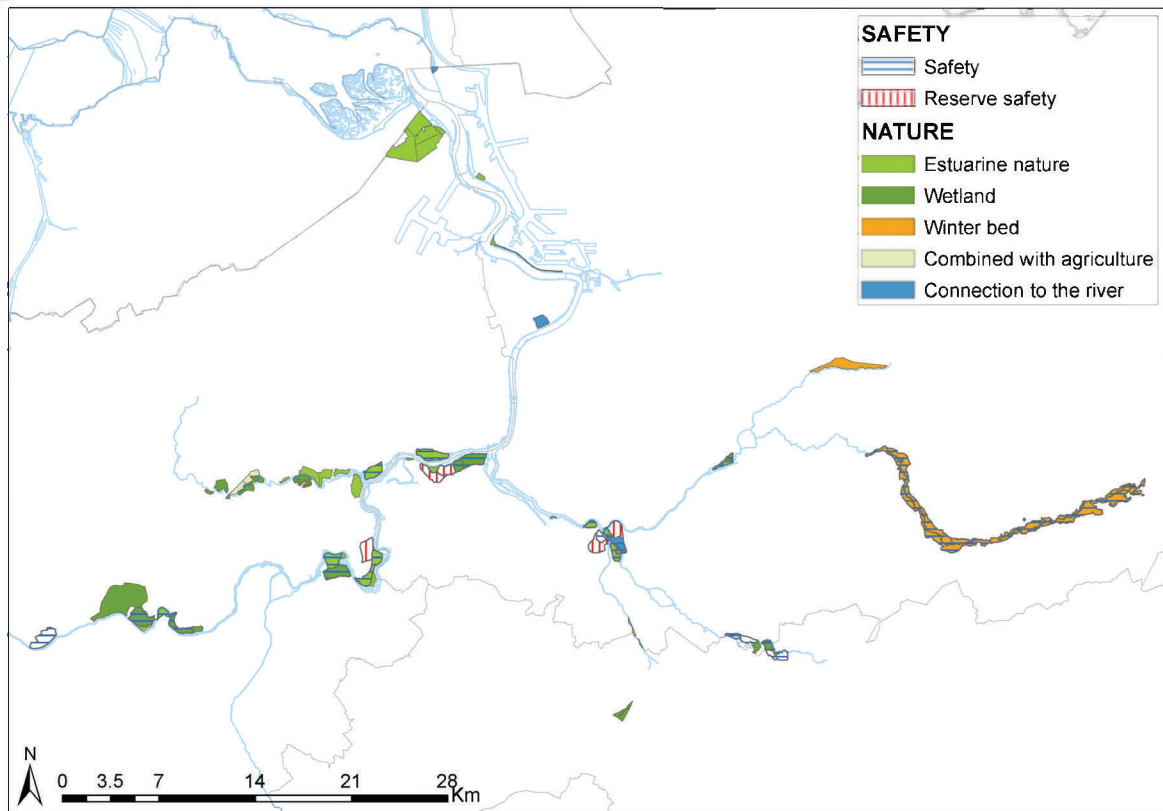
**Figure 2:** Cumulative area of (inter)national protected designations in the Scheldt Estuary. Source: The Agency for Nature and Forest (ANB), The Flemish Agency for Spatial Planning and Heritage (R-O Vlaanderen), Government Service for Land and Water Management (DLG), Research Institute for Nature and Forest (INBO), Ministry of Agriculture, Nature and Food Quality (LNV), Ministry of Housing, Spatial Planning and the Environment (VROM), Province of Zeeland.

### *Nature development in the framework of the Flemish Sigma Plan*

In the first Sigma Plan (1977, [6]) the only objective was to achieve an adequate protection against storm flooding from the North Sea (see indicator 'safety against flooding'). The dykes were raised and strengthened. Furthermore, 13 flood control areas were defined. Since then, new insights in terms of multifunctionality of the estuary, water level control and integrated water management resulted in a more sustainable approach of the safety issue. The updated Sigma Plan (2005, [3]) not only focuses on measures to promote flood protection but also aims at creating new non-estuarine and estuarine nature (see above).

The 'Most Desirable Alternative' (MDA) of the updated Sigma Plan was created through the evaluation of three different scenarios in projects by experts from each of the three sectors: nature, safety and agriculture. Figure 3 represents a map showing the location of areas of the Scheldt MDA which should return more space to the river. Certain areas are assigned either a nature or a safety function. For other areas, both functions will be combined.

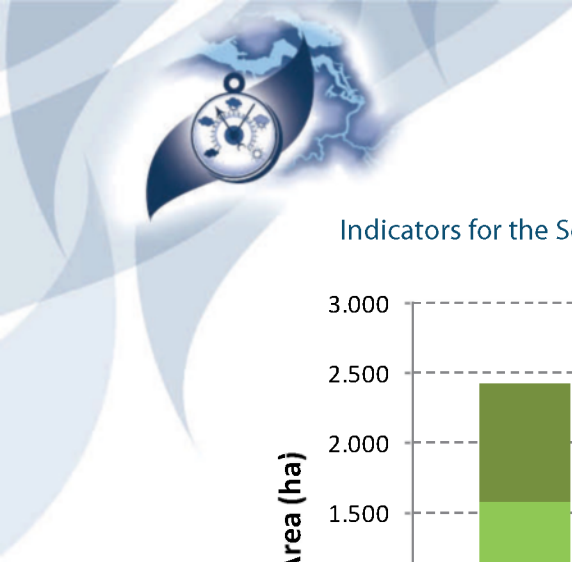
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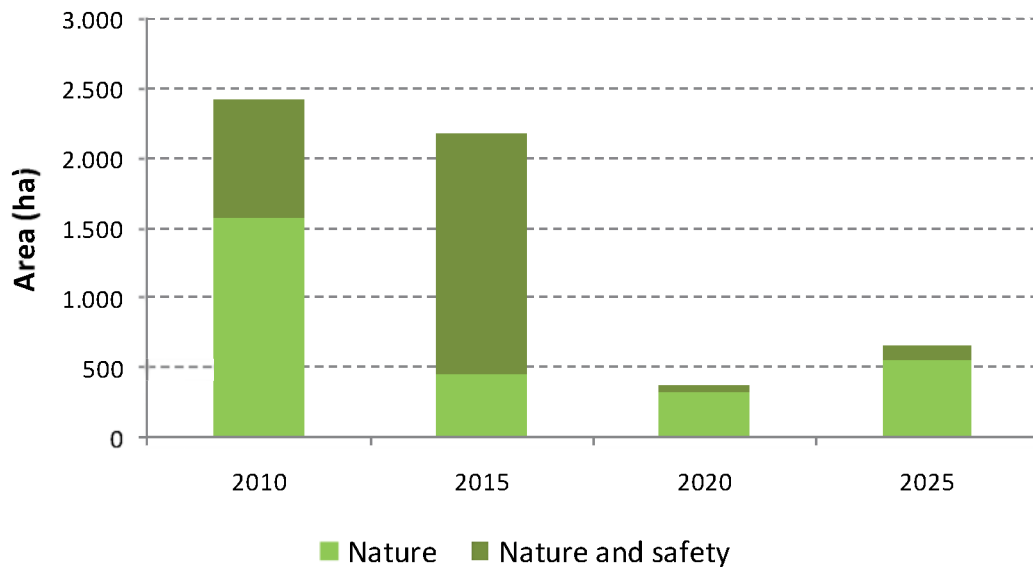
**Figure 3:** Location of areas in the context of the Most Desirable Alternative (MDA) of the updated Sigma Plan with respectively for safety and / or nature purposes. The cross-border project 'Hedwige-Prosperpolder' will be partly realized on Dutch territory (about 300 ha, not marked on the map). Source: Waterwegen en Zeekanaal WenZ (Waterways and Sea Channel).

Figure 4 is an overview of the natural areas which should be defined during the various phases of the MDA. The areas with a safety function will be discussed in the indicator 'safety against flooding'. Projects of the MDA (updated Sigma Plan), which should be started no later than 2010, account for a total of 2,417 ha of nature reserve (including approximately 300 ha of the cross-border project 'Hedwige-Prosperpolder' to be realized on Dutch territory). The Flemish Government decided to almost completely preserve this area. At 'De Bunt' in Hamme 33 ha less nature will be created than first foreseen. Furthermore, it was decided to create two natural areas earlier than planned: the reclamation 'Groot Schoor' (Hamme) and 'Groot Broek' (Waasmunster, Temse) will be launched no later than 2010 instead of 2015. It concerns an area of 91 ha, to compensate for the decision of assigning the area 'Gote Wal - Kleine Wal - Zwijn' as wetland rather than estuarine nature (see also below 'opportunities and threats'). A large area (> 2,100 ha) is also part of projects which will be launched no later than 2015. Before 2020 and 2025, respectively 360 and 650 ha of nature reserve should be realized.





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**Figure 4:** Overview of the area of natural areas (both with a natural function and integrated with a safety function) according to the planning of the Most Desirable Alternative (MDA) in the updated Sigma Plan (including approximately 300 ha on Dutch territory, the 'Hedwigepolder') Source: Waterways and Sea Channel.

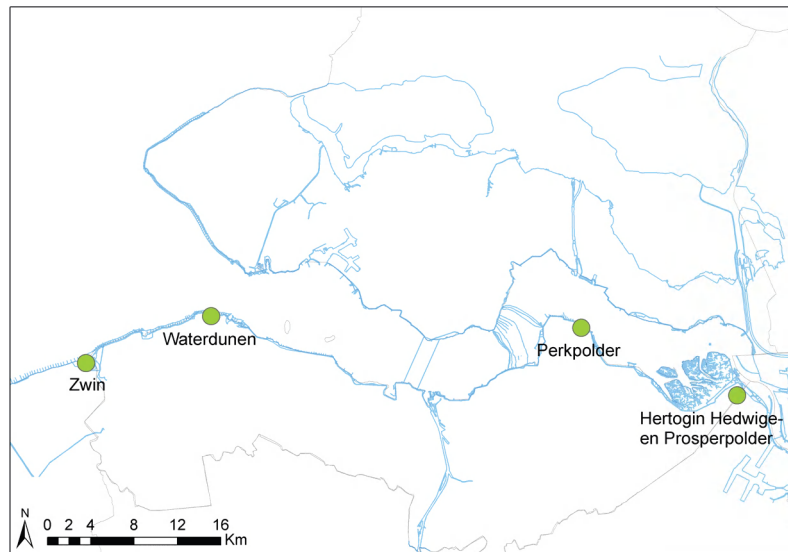
#### *Developments in the framework of the Dutch Nature Plan Westerschelde (natuurpakket Westerschelde)*

In the context of the LTV [1] and the favourable conservation status of the Natura 2000 area 'Westerschelde & Saeftinghe' [7], the Netherlands has decided to create at least 600 ha of new estuarine nature. This estuarine nature will consist of salt marshes, tidal mudflats, shallow water area and channels with a direct connection to the Scheldt Estuary and its tidal regime.

The Nature Plan Westerschelde includes two cross-border projects: the expansion of 'the Zwin' with 120 ha, including at least 10 ha on Dutch territory, and the reclamation of the 'Hedwige-Prosperpolder', with 295 ha on Dutch territory. The remaining 295 ha of new estuarine nature along the Westerschelde will be achieved by means of a selection of nature restoration projects in the area 'Middengebied' (the zone between Vlissingen and Hansweert). These include the projects 'Waterdunen' (250 ha, of which only a small part is assigned as new estuarine nature) and 'Perkpolder' (35 ha will be part of the Nature Plan Westerschelde, whereas the remaining 40 ha belong to the nature compensation area for the second extension of the navigation channel of the Westerschelde) but also the upgrade of ecologically degraded nature on the outer dikes [4, 8, 9]. It is defined in the 'Westerschelde Covenant' [10] that the projects of the Westerschelde Nature Plan (natuurpakket Westerschelde) should be launched by 2010. Figure 5 shows the location of the project areas Zwin, Hedwige-Prosperpolder, Waterdunen and Perkpolder.



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**Figure 5:** Location of the project areas Zwin, Hedwige-Prosperpolder, Waterdunen and Perkpolder, which are part of the Westerschelde Nature Plan (natuurpakket Westerschelde). Source: Province of Zeeland.

## Where do the data come from?

- Various institutes provided data about protected areas and landscapes in Flanders and the Netherlands: The Agency for Nature and Forest (ANB), The Flemish Agency for Spatial Planning and Heritage (R-O Vlaanderen), Government Service for Land and Water Management (DLG), Research Institute for Nature and Forest (INBO), Ministry of Agriculture, Nature and Food Quality (LNV), Ministry of Housing, Spatial Planning and the Environment (VROM), Province of Zeeland.
- The details of the Sigma Plan were provided by Waterways & Sea Channel and the Research Institute for Nature and Forest.
- Data concerning the Westerschelde Nature Plan (natuurpakket Westerschelde) derive from the website of the province of Zeeland (June 21, 2010).

## Opportunities and threats

The protection of nature and landscapes in the Scheldt Estuary increased significantly during the last decades. This has ensured that more attention was paid to changes in land usage and other human activities that may affect the natural and cultural-historical valuable places along the Scheldt. In the context of the ecological functioning and the conservation of biodiversity, besides the area of protected designation also the degree of fragmentation and the current status of species and habitats for which the protected areas were defined, are important. (see also the indicators 'status of species and habitats' and 'threats to biodiversity'). Good water and environmental conditions are also necessary for achieving the nature objectives of the LTV (see indicators 'surface water quality' and 'loads of pollutant substances'). Furthermore, agriculture can contribute to nature protection in rural areas as well (see indicator 'opportunities for nature'). A positive impact is expected on the maintenance and strengthening of the traditional biological communities and habitats along the Scheldt Estuary as a result of the creation of new (estuarine) nature in the framework of the Sigma Plan and the Westerschelde Nature Plan. These measures will be reflected in an increase of ecologically valuable shallow water ecotopes and intertidal areas (mud flats, plates) and salt marshes (see indicator 'morphology and dynamics in the estuary') which will subsequently enhance its potential as reproduction and breeding areas for fish, crustaceans



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and mollusks. Hence, the fishery could possibly take advantage of these developments (see indicator 'fishing').

For every project area of the Sigma Plan, development plans are set up to ensure the implementation of the Flemish government decisions without losing sight of the optimal realization of the MDA. The detailed organization of the areas often differs from the global goals of the MDA: e.g. due to boundary adjustments to save existing buildings and farms. Only the optimal and comprehensive realization of the MDA can meet the conservation objectives for the Scheldt Estuary in the context of the Habitats and Birds Directive [11, 12, 13], if the water quality is sufficient. Therefore, the 'Nature accountancy of the Scheldt Estuary' tracks to what extent the actual development plans, the decisions of the Flemish Government and the planned changes (development plans) affect the realization of these objectives [11].

The technical fact sheets of the measurements included in this indicator describe definitions, data, methodology and their limitations. The fact sheets are available at:

<http://www.scheldemonitor.org/indicatorfiche.php?id=16>

## Integration with other indicators/measurements?

Most of the links were already mentioned above. Protecting valuable natural areas and the further development of nature reserves in the Scheldt Estuary also creates new opportunities for recreation and tourism. Cycling and walking trails along areas with a high natural value increase the quality of the recreational-tourism offer. The natural values along the Scheldt bring together recreation, relaxation, and wonder for nature. The integration of a natural, safe and touristically attractive Scheldt Estuary will enhance the financial value of the touristic sector (see indicators '(opportunities for) recreation' and 'socio-economic importance of residential tourism').

## How to cite this factsheet?

**Anon.** (2010). Protection and development of natural areas. Indicators for the Scheldt estuary. Commissioned by the Maritime Access Division, project group EcoWaMorSe, Flemish-Dutch Scheldt Commission. *VLIZ Information Sheets*, 228. Flanders Marine Institute (VLIZ): Oostende. 8 pp.

Online available at: <http://www.scheldemonitor.org/indicatoren.php>

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[13] Indicator 'status of species and habitats': <http://www.scheldemonitor.org/indicatorfiche.php?id=13>