



Indicators for the Scheldt estuary

Status of species and habitats



Only 4 of 30 (or 13%) of the species and habitats in Natura 2000 areas of the Scheldt estuary have a favourable conservation status at the wider biogeographical regions level (CS-BGR). At the level of protected areas, the conservation status of species and habitats is being assessed following the criteria of the Standard Data Forms (CS-PA). All Habitats Directive species in the protected areas 'Schelde- en Durmeëstuarium' and 'Vlakte van de Raan' are in a good or excellent CS-PA. Three of the five species in 'Westerschelde & Saeftinghe' have a good CS-PA. The CS-PA of the crested newt in 'Zwin & Kievittepolder' is averaged or reduced. Almost all bird species that are designated in the Special Protection Areas (Birds Directive) of the Scheldt estuary have a good or excellent CS-PA. The number of breeding pairs and the breeding success of coastal birds in the Scheldt estuary often shows an irregular trend. Many environmental factors (e.g. weather, predation, existing vegetation ...) affect this breeding success.

Why monitor this indicator?

The Long-term Vision for the Scheldt estuary [1] envisages a healthy and dynamic estuarine ecosystem with the target 2030. This target 2030 refers to EU directives related to biodiversity and habitat protection as a basis for social recognition and establishment of the unique values of the estuary from the mouth to Gent: "As one of the most important estuaries with a full ebb and flood regime and complete freshwater to saline gradient in Europe, the estuarine ecosystem, with its typical habitats and communities along the salinity gradient is preserved and where possible, strengthened."

The European Habitats Directive [2] aims at a favourable conservation status of the habitat types listed in Annex I and the species in Annex II, IV and V of this directive. European member states must report every six years on the conservation status of these species and habitats of European importance on a biogeographical level (CS-BGR). This happened for the first time in 2007. Flanders entirely belongs to the 'Belgian Atlantic (biogeographical) region', i.e. Belgium north of the Samber and Maas including a part of Wallonia. The Netherlands completely belongs to the 'Dutch Atlantic region'. Objective criteria determine if a species or habitat has a 'favourable', 'unfavourable-inadequate' or 'unfavourable-bad' conservation status. Conservation objectives provide the scientific rulers on the basis of which the conservation status is to be tested. Flanders has first drawn up regional conservation objectives for this purpose. The Netherlands has written down the national targets in the Natura 2000 targets document and the profile documents per habitat type and species. Next, these will be translated to the individual protected areas (see below). Flanders has done this for the Scheldt estuary in a very early stage [3]. For the Netherlands, the objectives at area level can be found in the (draft) designation decisions [4].

The European Birds Directive [5] wishes to ensure the conservation of bird species from Annex I and species that occur as breeding, migratory or hibernating bird in a specific area in international important numbers. An official reporting to Europe, on the status of these species - assessed against the conservation objectives - has not yet happened. This reporting will take place at national level but the format and frequency of reporting (probably every six years) is still being debated. As it appears now, there will only be reporting on distribution, numbers, short and long term trends and threats but not on the overall status of the species of the Birds Directive at the regional level.

Under the Habitats and Birds Directives, member states need to designate protected areas (Special Areas of Conservation, SACs and Special Protection Areas, SPAs respectively), which together form the Na-



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tura 2000 network, an ecological network of protected areas in Europe. In this network, the concerning habitat types and species need to be conserved in a sustainable way and if possible in harmony with traditional land uses.

An assessment of the conservation objectives at the level of the individual protected areas, is desirable for the future. This report is the most appropriate to follow up on the CS of the protected species and habitats of the Habitats Directive and the status of bird species of the Birds Directive. How this report will look like and when it will be reported is not clear yet .



Both in European and global context the estuary contains rare landscapes and habitats including brackish and freshwater mud flats and marshes. The conservation objectives for the Scheldt estuary [3] describe that an additional area of at least 500 ha of mud flat is needed compared to the current situation to guarantee a good carrying capacity of benthic organisms for birds and fish. Moreover it is stated that "unless the water quality could be restored to the extent that limitation of dissolved silicon does not occur any more for diatoms, an additional area of 1,500 hectares of marshes is needed in the Scheldt to address this limitation. The designation decision Westerschelde & Saeftinghe also provides an extension of a number of Natura 2000 habitat types such as 'estuaries', 'salt tolerant plants colonizing mud and sand, glasswort' and 'Atlantic salt meadows, outside the dike' to obtain a favourable conservation status [6].

The success of species at the top of the food chain can be used as a proxy for the quality of the overall ecological functioning of the Scheldt estuary. This indicator therefore further examines the numbers and breeding success - a measure of the viability of the population - of a selection of coastal breeding birds along the Scheldt. Furthermore the (quality and amount of) potential habitat for birds and other organisms is an important indicator. On the one hand, one can focus on the CS-PA or CS-BGR of the Natura 2000 habitats (see below). In a broader context, the development of the areas of the different 'ecotopes', especially the low dynamic (with low rate of flow) shallow water areas, intertidal areas (mud flats, sand flats) and salt marshes is important in the Scheldt estuary. Mud and sand flats are usually rich in benthic organisms and provide an important food source for birds, e.g. waders. Low dynamic shallow water areas are in turn essential for reproduction and growth (nursery function) of fish, crustaceans and molluscs. Marshes provide nesting opportunities for many bird species. Moreover, they act as a refuge during high water. The indicator 'morphology and dynamics in the estuary' goes in-depth in this matter.



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What does the indicator show?

The SACs and SPAs of the Scheldt estuary are shown in figure 1 (situation 2009). Large parts of the estuary are designated as protected area under the Habitats or Birds Directive or both. There are currently 4 SACs and 6 SPAs in the Natura 2000 network attached to the Scheldt estuary. Two of them enjoy recognition as both SPA and SAC: Westerschelde & Saeftinghe, Zwin & Kievittepolder (see figure 1). The protected areas of the Scheldt estuary have been designated in order to preserve European important habitats, including the 'estuary' itself, the 'spartina swards' and 'Atlantic salt meadows', and species such as the common seal, the allis and twaite shad, the crested newt, the gadwall and the curlew.

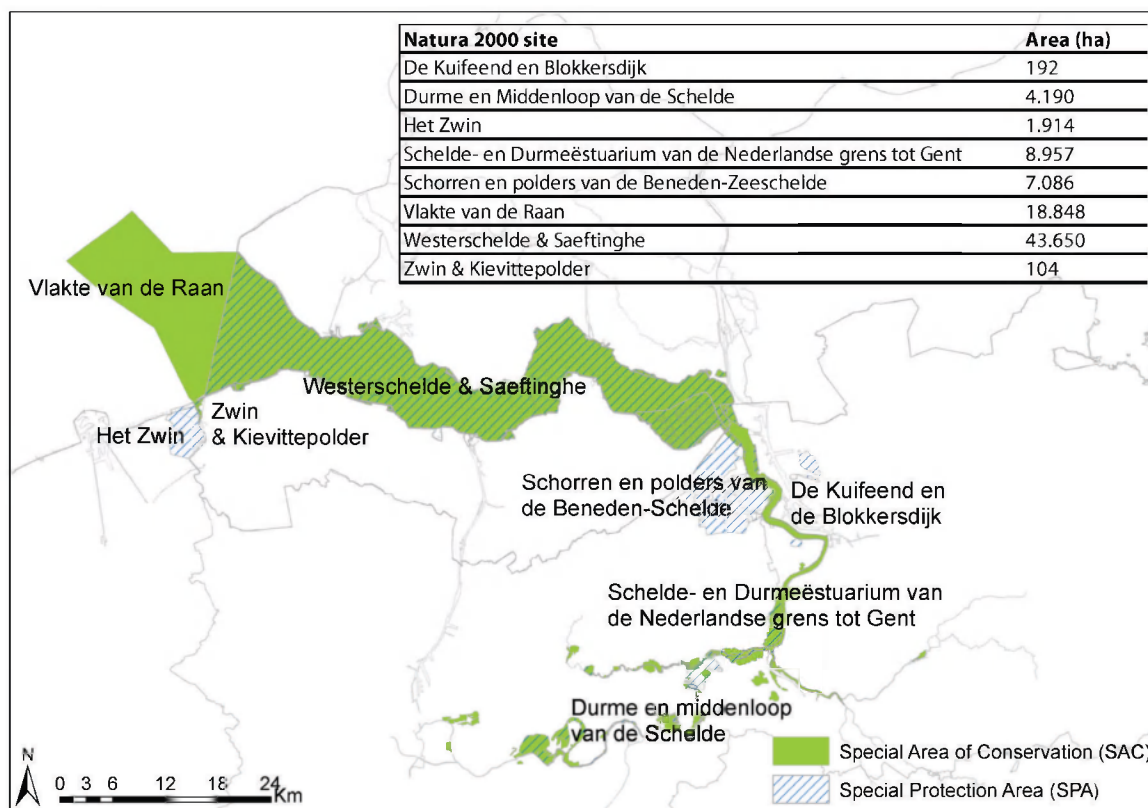


Figure 1: Map of the Special Areas of Conservation (SACs) and the Special Protection Areas (SPAs) in the Scheldt estuary, designated respectively as part of the Habitats and Birds Directives (situation 2009). Source: Research Institute for Nature and Forest (INBO); Ministry of Agriculture, Nature and Food Quality (LNV).

Pending a possible reporting of the CS of habitats and species of the Habitats Directive and the status of the species of the Birds Directive at protected area level, one can rely on the assessment of the conservation status on protected area level following the criteria of the Standard Data Forms (CS-PA). The CS-PA indicates the status of habitats and species of the Habitats Directive (Annex I and II), and the species of the Birds Directive (Annex I species and migratory species not included in Annex I), for each SAC and SPA of the Scheldt estuary. The CS-PA is also reported at least every six years to Europe. Objective criteria determine if a species or habitat has an 'excellent', 'good' or 'averaged or reduced' CS-PA. More information can be found in the technical fact sheets of the indicator [7].

The relationship of the "CS-PA" with any future reporting of conservation status or situation at protected area level is not straightforward. Currently the project "conceiving monitoring Natura 2000 and management" is running in Flanders (until 2012) and only after that it will be clear what for and how monitoring



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will proceed. In the Netherlands such future reporting is not clear-cut yet either. The CS-PA is mainly about the legal / planning protection regime, while the CS-BGR is an effective ecological assessment of the concerning species and habitats. Moreover, the evaluation of the CS-BGR at biogeographical level is based on more stringent criteria than the assessment of CS-PA at area level. The CS-PA of the habitat types and species of the Habitats at SAC level, is compared here to their CS-BGR at biogeographical level. This draws a slightly different picture about the status of habitat types and species of European interest in the Scheldt estuary. The data on the CS-PA also are often outdated (Netherlands, 2004, HRL, 2007, VRL; Flanders: 2001, partial update in 2008). Trends of both the CS-PA and CS-BGR can therefore not be displayed yet.

Habitat types of the Habitats Directive

The assessment of the CS-PA at level of the protected areas indicates that 6 of the 11 (> 50%) habitat types that were designated in the SAC "Schelde- en Durmeëstuarium van de Nederlandse grens tot Gent" have a good CS-PA (see table 1, columns 'CS-PA'). For the protected area Westerschelde & Saeftinghe this applies to 4 of the 6 habitat types. All habitats of the SAC 'Zwin & Kievittepolder' have an excellent CS-PA. For the Vlake van de Raan, the only designated habitat type "sandbanks which are covered by sea water all the time" is in an averaged or reduced state. In comparison, of the different habitat types for which the CS-PA was determined, 11 of the 12 (> 90%) have a very unfavourable conservation status in Flanders (CS-BGR), while in the Netherlands this applies to 3 of the 10 habitats (30%) (see figure 1, columns "CS-BGR"). Only 2 of a total of 18 habitat types in the Scheldt estuary have a favourable CS-BGR: the habitat types 'embryonic shifting dunes' and 'dunes with sea buckthorn' in the Netherlands, which do occur not in the Flemish part of the Scheldt estuary.

The often large difference between the regional CS-BGR and CS-PA at area level is related, among others, to the fact that the latter takes into account the prospects for the functioning of the habitat types (capacities considering on the one hand the unfavourable influences and on the other hand all the reasonable conservation effort which is possible) and restoration possibilities. Within the Scheldt estuary, these are generally favourable, so it is expected that any current poor quality (CS-BGR) will or can improve. Also, some habitats, only have a small proportion of their surface area in the estuary (Paelinckx, D., pers. comm.).



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		CS-PA	CS-BGR	CS-PA	CS-PA	CS-PA	CS-BGR
		FL: Schelde- en Durmeestuaria van de Nederlandse grens tot Gent (BE2300006)	Flanders	NL: Westerschelde & Saefinghe (NL9803061)	NL: Zwin & Kievitpolder (NL3000027)	NL: Vlakte van de Raan (NL2008003)	The Netherlands
Code	Habitat type						
1110	Sandbanks which are covered by sea water all the time						
1130	Estuaries						
1310	Salt tolerant plants colonizing mud and sand						
1320	Spartina swards						
1330	Atlantic salt meadows						
2110	Embryonic shifting dunes						
2120	White dunes						
2130	Grey dunes						
2160	Dunes with sea buckthorn						
2190	Humid dune slacks						
2310	Dry sand heaths with ling						
2330	Drift sands						
3150	Natural eutrophic lakes with water soldier and pondweeds						
6410	Molinia meadows						
6430	Hydrophilous tall herb fringe communities						
6510	Lowland hay meadows						
9160	Oak-hornbeam forests						
91E0	Alluvial forests						

Table 1: Conservation status at protected area level (following criteria of the Standard Data Forms, CS-PA) of the annex I - habitats of the Habitats Directive, per Special Area of Conservation of the Scheldt estuary (FL: 2001, NL: 2004, partial update in 2008) and conservation status of the same habitats at biogeographical level (CS-BGR) (2007). The typical habitats of the estuary are indicated in bold. The other habitat types of the adjacent hinterland can sometimes cover only very small areas because of the natural scarcity of environmental conditions that are needed for these habitat types. Explanation of colour codes CS-PA: orange - averaged or reduced, dark green - good, blue - excellent. Explanation of colour codes CS-BGR: red - unfavourable-bad, yellow - unfavourable-inadequate, lemon green - favourable. White - habitat type does not occur in this part of the estuary. The extensive description of habitat types is presented in the technical fact sheet of the measurement [7]. Source: Research Institute for Nature and Forest (INBO); Ministry of Agriculture, Nature and Food Quality (LNV).



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Species of the Habitats Directive

All species (annex II) in the SAC's 'Schelde- en Durmeëstuarium' and 'Vlakte van de Raan' have a good or excellent CS-PA (see table 2, columns "CS-PA"). Common seal and river lamprey have an averaged or reduced state in the protected area Westerschelde & Saefthinghe. The condition of the crested newt in 'Zwin & Kievittepolder' is also average or reduced. The CS-PA of species was compared with the results of the CS-BGR of the same species at biogeographical level. In Flanders and the Netherlands respectively, 3 of 4 (75%) or 9 of 10 (90%) of the species of the Habitats Directive are in a bad CS-BGR (see table 2, columns "CS-BGR"). Only the bitterling (FL) and the common seal (NL) have a favourable status at biogeographical level. The often large difference between the regional CS-BGR and CS-PA at area level is related, among others, to the fact that the latter takes into account restoration possibilities. Within the Scheldt estuary, these are generally favourable, so it is expected that any current poor quality (CS-BGR) will improve. Also, some species, only have a small proportion of their population in the estuary (Paelinckx, D., pers. comm.).

			CS-PA	CS-BGR	CS-PA	CS-PA	CS-PA	CS-BGR
			FL: Schelde- en Durmeëstuarium van de Nederlandse grens tot Gent (BE2300006)	Flanders	NL: Westerschelde & Saefthinghe (NL9803061)	NL: Zwin & Kievittepolder (NL3000027)	NL: Vlakte van de Raan (NL2008003)	The Netherlands
Code	Species group	Species name						
1166	Amphibians	Crested newt						
1903	Vascular plants	Yellowwidelip orchid						
1134	Fish	Bitterling						
1102	Fish	Allis shad						
1103	Fish	Twaite shad						
1149	Fish	Spined loach						
1099	Fish	River lamprey						
1095	Fish	Sea lamprey						
1014	Invertebrates	Narrow-mouthed whorl snail						
1351	Mammals	Porpoise						
1365	Mammals	Common seal						
1364	Mammals	Grey seal						

Table 2: Conservation status at protected area level (following criteria of the Standard Data Forms, CS-PA) of the annex II - species of the Habitats Directive, per Special Area of Conservation of the Scheldt estuary (FL: 2001, NL: 2004, partial update in 2008) and conservation status of the same species at biogeographical level (CS-BGR) (2007). Certain species are less typical for the estuary, e.g. narrow-mouthed whorl snail, spined loach. The twaite shad meanwhile occurs in the Belgian part of the estuary. Explanation of colour codes CS-PA: orange - averaged or reduced, dark green - good, blue - excellent. Explanation of colour codes CS-BGR: red - unfavourable-bad, yellow - unfavourable-inadequate, lemon green - favourable. White - species does not occur in this part of the estuary. The Latin name of the species is presented in the technical fact sheet of the measurement [7]. Source: Research Institute for Nature and Forest (INBO); Ministry of Agriculture, Nature and Food Quality (LNV).



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Species of the Birds Directive

Almost all bird species that are designated by the Birds Directive in the SPAs of the Scheldt estuary have a good or excellent CS-PA (see figure 2). Only in the SPAs 'Schorren van de polders van de Beneden-Zeeschelde' and 'Westerschelde & Saeftinghe', the CS-PA of some species is averaged or reduced. In the first protected area this applies to the avocet, in the second area this concerns the white-fronted goose, the red-breasted merganser, the oystercatcher, the turnstone and the knot. The technical fact sheet of this measurement gives an overview of all bird species designated in the SPAs of the Scheldt estuary and for which the CS-PA status was determined [7].

For the birds, the comparison with the status at biogeographical level (NL) or at the Flemish level (FL) is not conducted here. Of the CS-BGR, an official reporting to Europe has not happened yet. But again the same message prevails: the CS-PA should be interpreted with caution.

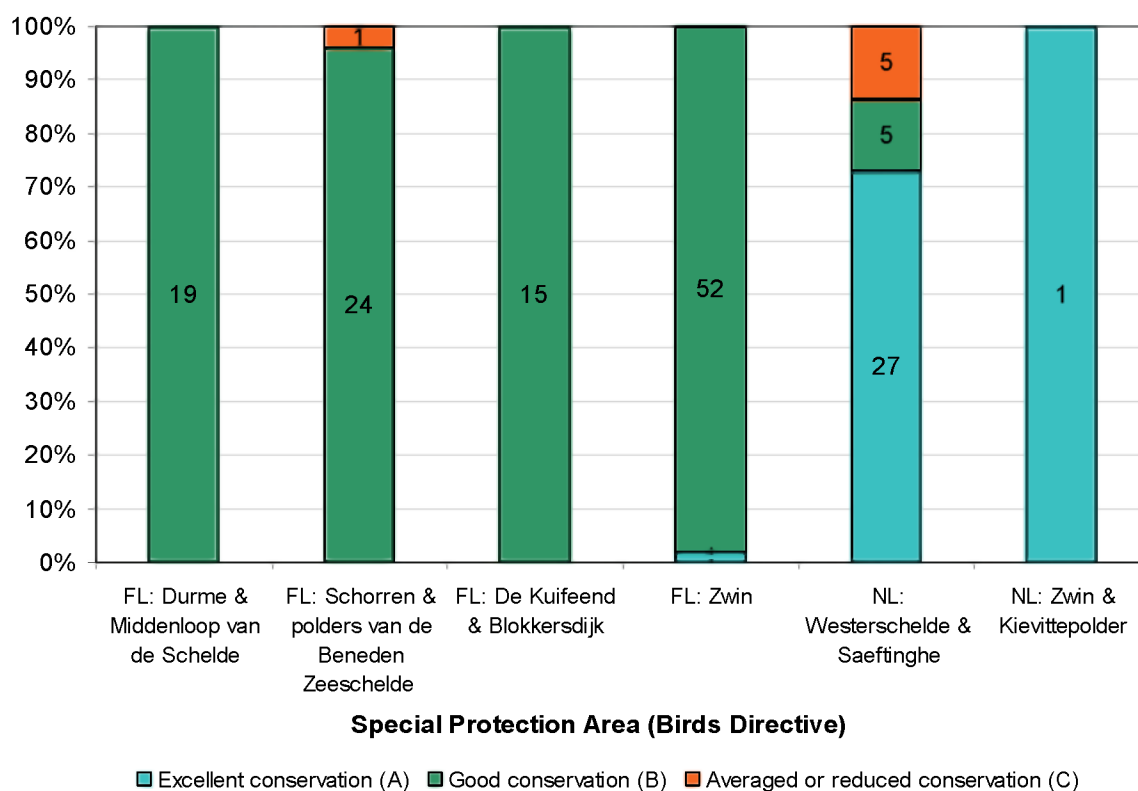


Figure 2: Percentage of the species of the Birds Directive (annex I species and migratory species not included in annex I), per class of the CS-PA, per Special Protection Area of the Scheldt estuary (FL: 2001, NL: 2007). The figures in the bars refer to the absolute number of species. Source: Research Institute for Nature and Forest (INBO); Ministry of Agriculture, Nature and Food Quality (LNV).

It is necessary to wait for a report on the conservation status of species and habitats of the Habitats Directive and the status of bird species of the Birds Directive at protected area level, to be able to make a good, area specific estimation on the protection of species and habitats of European interest throughout the Scheldt estuary.



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Number of breeding birds

Assessing the number of breeding pairs of (coastal) breeding birds fits among other things in the obligations which the European Birds Directive imposes to member states concerning inventory and reporting (see above). In addition, such monitoring is necessary to enable judgements about the effects of design and management and to adjust policy where necessary.

In the Westerschelde, its mouth (i.e. a piece of the Voordelta) and other parts of the Delta, the number of breeding pairs of coastal birds is monitored since 1979 [8]. The monitoring of (coastal) breeding birds in the Zeeschelde started in 2003 on the Left bank area, which largely coincides with the SPA 'Schorren en polders van de Beneden-Schelde'. Meanwhile, monitoring has also started in a part of the Right bank area in the port of Antwerpen and in the context of the updated Sigma plan so that in the future, integrated monitoring data will be available from the Zeeschelde including almost the whole port of Antwerpen and the nature protection projects (additional to the Habitats and Birds Directive) [9].

The Westerschelde and the Delta Area

The distribution of coastal breeding birds in the Westerschelde can, for some species such as the little tern, sandwich tern, common tern, black-headed gull, ringed plover and Kentish plover, not be decoupled from breeding places in the wider Delta area.

Table 3 displays the number of breeding pairs of coastal breeding birds in the Westerschelde (including mouth) and for the relevant species in the Delta area in 1979 and 2008. For most species a generally positive trend can be observed (green in the table). For two of the six 'vagrant' species the trend in the Westerschelde differs from the one in the Delta area: the breeding populations of sandwich tern and ringed plover have progressed in the Westerschelde while a decline in the Delta area was observed in 2008 compared to 1979. For the sandwich tern this deviation is due to strong fluctuations in the population. Sandwich terns are very critical in the choice of the breeding place that depends on several environmental factors (see below). The increase of ringed plovers mainly took place on the dikes along the Westerschelde, where the introduction of new dike lining since the turn of the century has (temporarily) created new breeding grounds.

In the Westerschelde, especially the number of breeding pairs of the black-headed gull has plummeted. A low breeding success (also see below) and changed farming practices at European level are cited as possible factors. The sandwich tern has, together with the black-backed gull, one of the fastest growing breeding bird populations in the Westerschelde: the number of breeding pairs increased from 0 and 1 respectively in 1979 to more than 4,400 in 2008. Breeding pairs of the black-winged stilt, Arctic tern and common gull were, in the period examined, only sporadically observed in the Westerschelde and its mouth and are therefore not included in table 3.

	Westerschelde (and mouth)		Delta area (remaining)	
	1979	2008	1979	2008
Ringed plover	5	27	222	134
Little tern	81	254	149	287
Sandwich tern		4,405	3,130	2,633
Black-backed gull	1	4,427		
Little ringed plover	13	28		
Avocet	291	328		
Black-headed gull	27,492	3,674		
Kentish plover	31	29	483	115
Common tern	441	1,858	1,546	4,510
Herring gull	5,538	4,589		
Mediterranean gull		193	1	769

Table 3: Number of breeding pairs of coastal breeding birds in the Westerschelde (including mouth) and for relevant species also in the Delta area in 1979 and 2008. Red means a negative trend, green a positive trend. Source: Directorate General for Public Works and Water Management (RWS), [8]



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Breeding bird numbers in the entire Delta area often fluctuate strongly from year to year (see Figure 3). Environmental factors such as vegetation (succession stage), predation, distance to feeding areas can greatly affect the fate of the breeding bird population. Nature development (see 'integration with other indicators / measurements?') and other management measures (e.g. dumping of shells at favourable locations) can create new breeding grounds and make existing nesting sites more suitable [8].

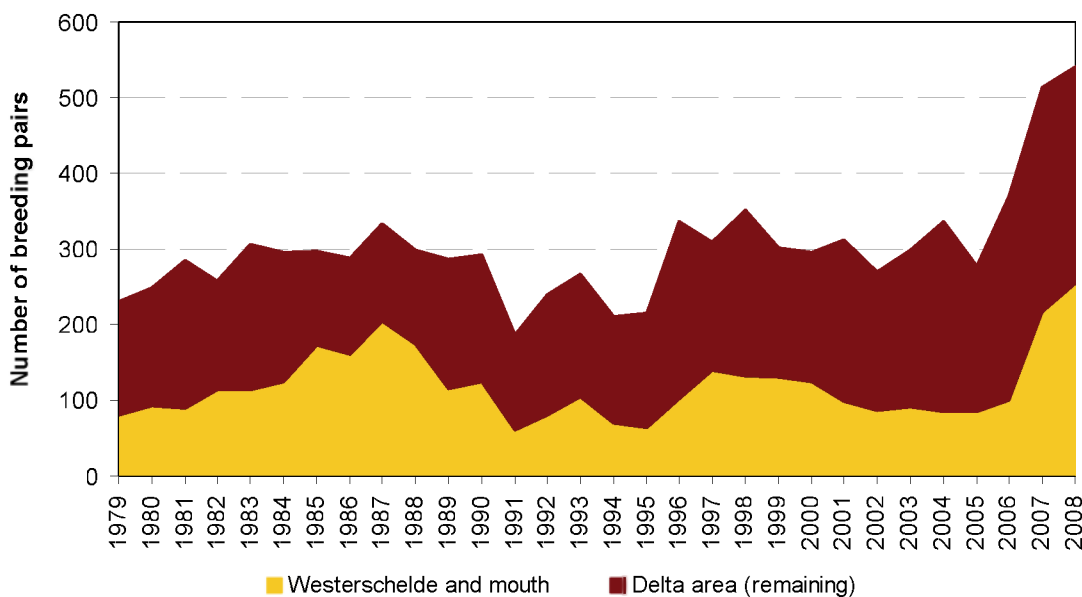


Figure 3: Number of breeding pairs of the little tern in the Westerschelde (including part of the Voordelta) and the remaining Delta area. Source: Directorate General for Public Works and Water Management (RWS), [8]

Zeeschelde

As in the Westerschelde and the Delta area, the numbers of breeding birds in the Zeeschelde (Left bank area of the Scheldt) show an erratic trend (see figure 4). Species such as the common tern, black-headed gull, Mediterranean gull, little ringed plover and avocet have a fluctuating breeding population with an average number of breeding pairs of, respectively, 180, 2,750, 350, 30 and 160 in the period 2003 - 2009. The black-headed and Mediterranean gull breed variably on different possible locations throughout the Antwerpen port area, which may explain the fluctuating numbers. The avocet and little ringed plover react strongly to the presence of open and sparsely covered terrain that is created at management activities. The Kentish plover is a rare breeding bird in the Left bank area (and in Flanders as a whole). There is no stable population. The black-winged stilt, little tern and ringed plover only occur occasionally in the Zeeschelde. The number of breeding pairs of the spoonbill rose from one couple in 2003 to 18 - 19 breeding pairs in recent years. Of the coastal birds for which conservation objectives have been defined for the Left bank area of the Scheldt (common tern, black-headed gull, Mediterranean gull, Kentish plover, ringed plover, little ringed plover, avocet and black-winged stilt) the black-winged stilt, Mediterranean gull and black-headed gull populations achieve the targets [9].



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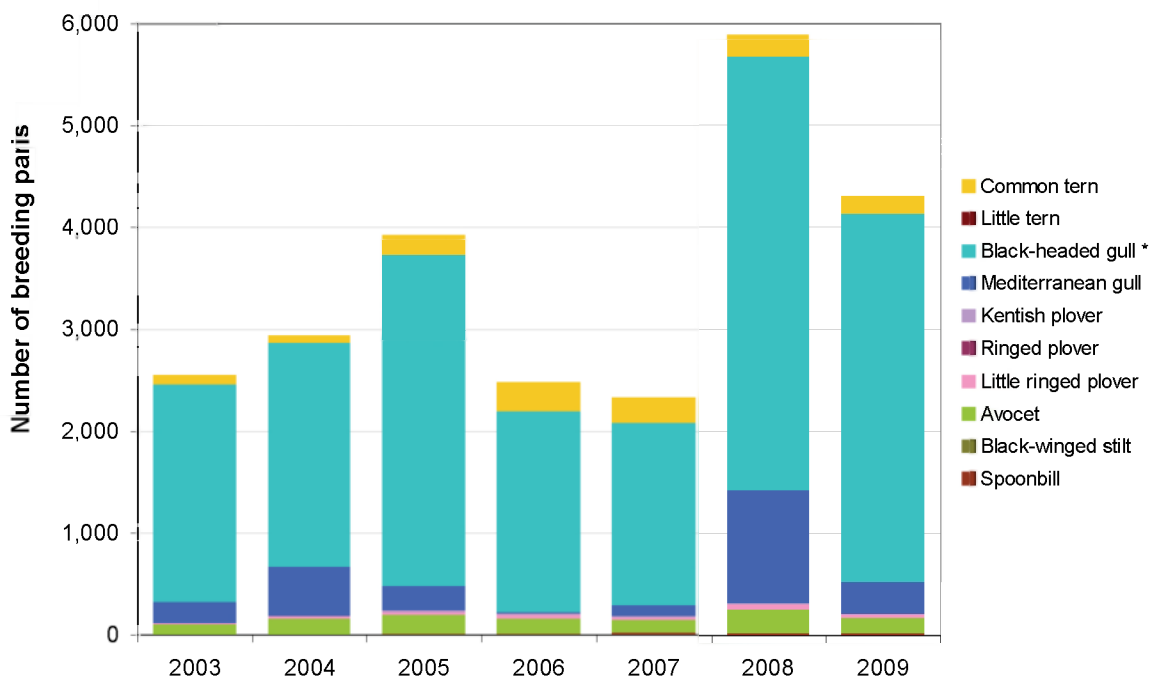


Figure 4: Number of breeding pairs of coastal breeding birds in the Zeeschelde (Left bank area of the Scheldt, 2003 - 2009). For 2003 and 2004 the number of breeding pairs of the black-headed gull is a minimum, read as 'more than x number of breeding pairs'. Source: Research Institute for Nature and Forest (INBO), [9]

Breeding success of coastal breeding birds

The Netherlands has monitored the breeding success of coastal breeding birds in the Westerschelde in the period 1996 - 2005. This monitoring was put to a stop. Flanders follows the breeding success of coastal breeding birds in the Zeeschelde (Left Bank area of the Scheldt) since 2003. The boundaries of the study area are similar to the ones of the study on breeding pairs (see page 8) [9, 10]. The results of this monitoring can not be compared between the Netherlands and Flanders. On the one hand the species examined are not the same and on the other hand, comparing data is only possible when long time series are available that have been collected on a similar standardized way.

The breeding success of coastal birds in the Scheldt estuary often has an irregular trend which is reflected in the large standard deviations from the mean values (see figure 5). Many environmental factors (e.g. weather, predation, ...) affect this breeding success.

The average breeding success of coastal breeding birds in the Westerschelde in the period 1996 - 2004 was less than 0.5 fledged chicks per pair for almost all investigated species. Especially 2004 and 2005 were particularly poor breeding years: the sandwich tern, the little tern and in 2005 also the common tern produced, as far as known, virtually no fledged chicks. Predation of eggs and chicks, perhaps by black-headed gulls, is cited as a possible reason. Regarding the Kentish plover, it is very unlikely that the population can thrive in the Delta area (including Westerschelde) in the long term [10]. The ringed plover scores the best of all coastal birds examined with an average breeding success of 0.77 fledged chicks per pair.

In the Zeeschelde (Left bank area of the Scheldt), the spoonbill is doing particularly well with an average breeding success of two fledged chicks per nest in the period 2003 - 2009. Regarding the black-headed gull, one fledged chick per breeding pair is the necessary average to maintain the population. During the period examined, the average breeding success was only 0.9 fledged chicks per pair. For the Medi-



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terrestrial gull it is assumed that the guide value will be in the same order of magnitude. In none of the years the Mediterranean gull achieved this in the Left bank area of the Scheldt [9].

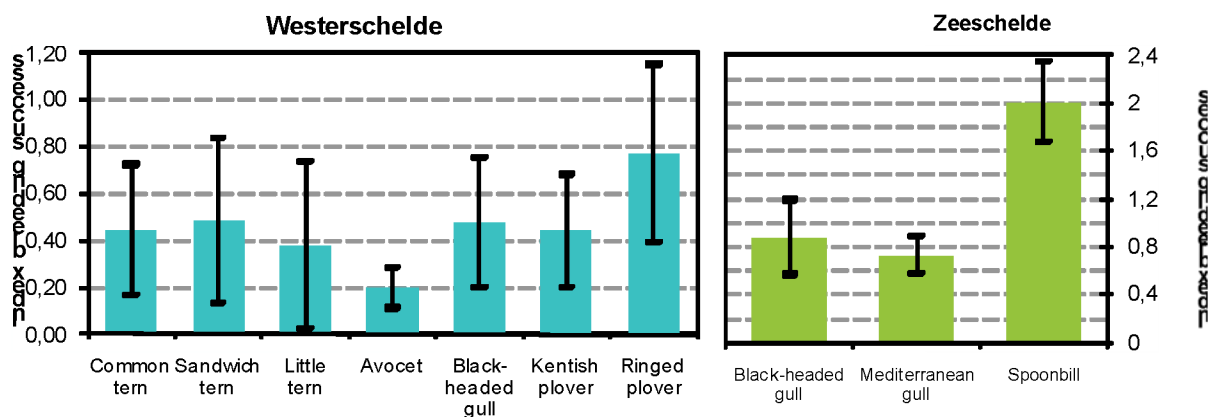


Figure 5: Average breeding success (and standard deviation) of coastal breeding birds in left: Westerschelde (based on data from 1996 - 2005, for the Kentish and ringed plover: 2000 - 2005) and right: Zeeschelde (Left bank area, based on data from 2003 - 2009). Source: Directorate General for Public Works and Water Management (RWS), Research Institute for Nature and Forest (INBO), [9, 10].

Water birds

With regard to water birds (e.g., common shelduck, pochard, teal, ...) there is also a lot of monitoring and research in the Scheldt estuary. In the Westerschelde, population trends of water birds in the period 1990 - 2008, depend on the type of food they consume. The number of worm-eaters (e.g. bar-tailed godwit), grass eaters (e.g., greylag goose) and fish-eaters on the river banks (e.g. little egret) has increased since the beginning of the nineties. More recently, the number of shellfish eaters (e.g. knot) has also increased. Other herbivores (e.g., mallard) and fish-eaters of the open water (e.g. grebe) are declining [11, 12]. In the Zeeschelde, the number of water birds has decreased since the winter of 2001 - 2002. Following the establishment of water treatment plants (see also indicators 'opportunities for nature' and 'loads of pollutant substances'), less organic matter ends up in the Scheldt and the system becomes more nutrient poor. Because of this, the mass of benthic organisms temporarily decreases, and thus the food supply for some birds. With an improved water quality, scientists expect a more balanced and diverse benthic fauna, and a restoration of the fish stocks (see indicator 'surface water quality') so that in the future, other bird species are attracted and species richness becomes higher [13].

Where do the data come from?

- Data on the conservation status of species and habitats at protected area level (following the criteria of Standard Data Forms) and biogeographical level (Habitats and Birds Directives) are collected by the Research Institute for Nature and Forest (INBO) and Ministry of Agriculture, Nature and Food Quality, programme management Natura 2000 (Min LNV).
- Data on numbers and breeding success of coastal breeding birds are provided by the Directorate General for Public Works and Water Management (RWS) and the Research Institute for Nature and Forest (INBO).



Opportunities and threats

The Habitats and Birds Directives and the designation of the European Natura 2000 network of protected areas were a major step forward for the conservation and recovery of species populations and habitats in Europe. Member states are obliged to report in a similar, standardized way on the state of nature. The coordination of this complex matter is carried out across borders, but is also integrated across disciplines and objectives (good ecological and chemical water quality (Water Framework Directive), spatial planning, social costs and benefits, data management, ...). Proceeding from the precautionary principle, there should be no interference with protected nature, unless there are specific and accurately delineated circumstances. New plans and projects, e.g. the third extension of the navigation channel, the updated Sigma plan ... require the establishment of an 'appropriate assessment' (Article 6 of the Habitats Directive). It examines whether the measures could have significant impact on the protected nature and where necessary compensation or mitigation measures need to be taken. Currently the six-year reporting on the conservation status of species and habitats is at a biogeographic level. The preparation of conservation objectives for each protected area of the Habitats and Birds Directives is underway.

The Habitats and Birds Directives focus on European important species. However regionally and locally there may be other species of interest that are not protected in the European context. Such species are also called 'attention species' [3, 14]. For the evaluation of the status of these attention species there is no general framework available yet. One possibility is to follow the status of those species on the so called Red Lists. Red Lists at the national level allow for a distinction between species that are locally extinct, threatened with extinction, vulnerable, ... This approach has both supporters and opponents. Red Lists fulfill an important signal function, but they are not always reviewed at regular intervals and quickly become outdated. Often for the lesser known species (groups) there is only a single evaluation available.

Analyzing the numbers and breeding success of coastal breeding birds in the Scheldt estuary is not only important in the context of achieving the objectives of the Birds Directive but also creates a picture of the overall health of the Scheldt ecosystem. In the original proposal to monitor parameters within the framework of the integrated monitoring programme LTV O&M 'breeding success of coastal birds' was included, but in the final approval of the plan by the Flemish-Dutch Scheldt Commission only 'number of breeding pairs' was selected.

Policy focuses regularly on the assessment of numbers of certain key species such as predators or species at the top of the food chain. This is a pragmatic approach, supported by scientific arguments. It is important to emphasize that these species do not necessarily reflect the status of the other components of the ecosystem. Conceptual models and methods are developed aiming at the evaluation of ecosystem processes rather than individual components or species. This is a complex issue and requires collaboration across research disciplines.

The specifications of the measurements on this indicator further describe definitions, data and methodology, and their limitations. The technical fact sheets are available at: <http://www.scheldemonitor.org/indicatorfiche.php?id=13>

Integration with other indicators/measurements?

Human activities in the Scheldt estuary, such as shipping, dredging and disposal of dredged materials, fisheries, tourism and sand extraction (see indicators 'population pressure', 'fisheries', 'nautical management', 'socio-economic importance of ports', 'soil interfering activities', '(opportunities for) recreation' and 'socio-economic importance of tourism'), can influence nature and environment because of e.g. discharge of waste products into the water and the air, transportation of non-indigenous plant and animal species, ... (see indicators 'loads of pollutant substances', 'surface water quality', 'threats to biodiversity', 'environmental effects of ports and shipping'). In addition, the Scheldt estuary is by nature a very dynamic system that is strongly influenced by the tidal movements and variations in salinity. As a



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result of these dynamics, it is difficult to distinguish human influences from natural variability and developments of the system. The maintenance of gradients and the preservation of habitats required for the characteristic plant and animal species (see indicator 'morphology and dynamics in the estuary') are prerequisites for the sustainable functioning of the estuarine food web and the achievement of international, European, national, regional and local targets for the conservation of nature in all its aspects.

Environmentally friendly agriculture schemes, re-establishing the fish migration and the purification of waste water are just some of the many measures that create opportunities for nature and can promote the conservation of species and habitats (see indicator 'opportunities for nature').

The creation of new estuarine nature and the conservation of valuable natural areas and landscapes in and along the Scheldt estuary by statutory protection statutes (see indicator 'protection and development of natural areas') is part of the policy measures for maintaining and where possible strengthening of the Scheldt ecosystem with all its typical habitats and communities.

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