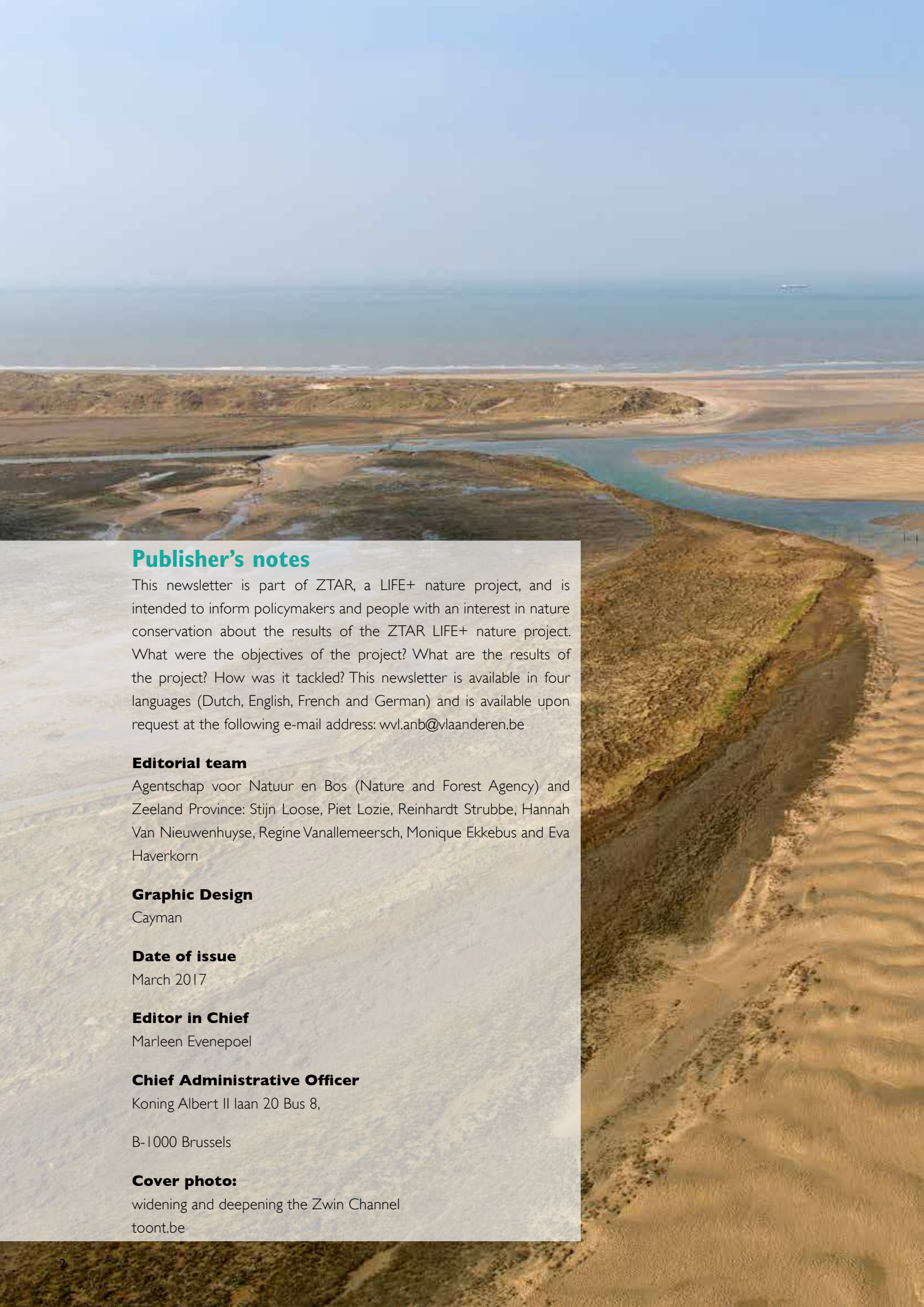


# HET ZWIN REVIVED! ZWIN TIDAL AREA RESTORATION





## Publisher's notes

This newsletter is part of ZTAR, a LIFE+ nature project, and is intended to inform policymakers and people with an interest in nature conservation about the results of the ZTAR LIFE+ nature project. What were the objectives of the project? What are the results of the project? How was it tackled? This newsletter is available in four languages (Dutch, English, French and German) and is available upon request at the following e-mail address: [wvl.anb@vlaanderen.be](mailto:wvl.anb@vlaanderen.be)

### Editorial team

Agentschap voor Natuur en Bos (Nature and Forest Agency) and Zeeland Province: Stijn Loose, Piet Lozie, Reinhardt Strubbe, Hannah Van Nieuwenhuyse, Regine Vanallemeersch, Monique Ekkebus and Eva Haverkorn

### Graphic Design

Cayman

### Date of issue

March 2017

### Editor in Chief

Marleen Evenepoel

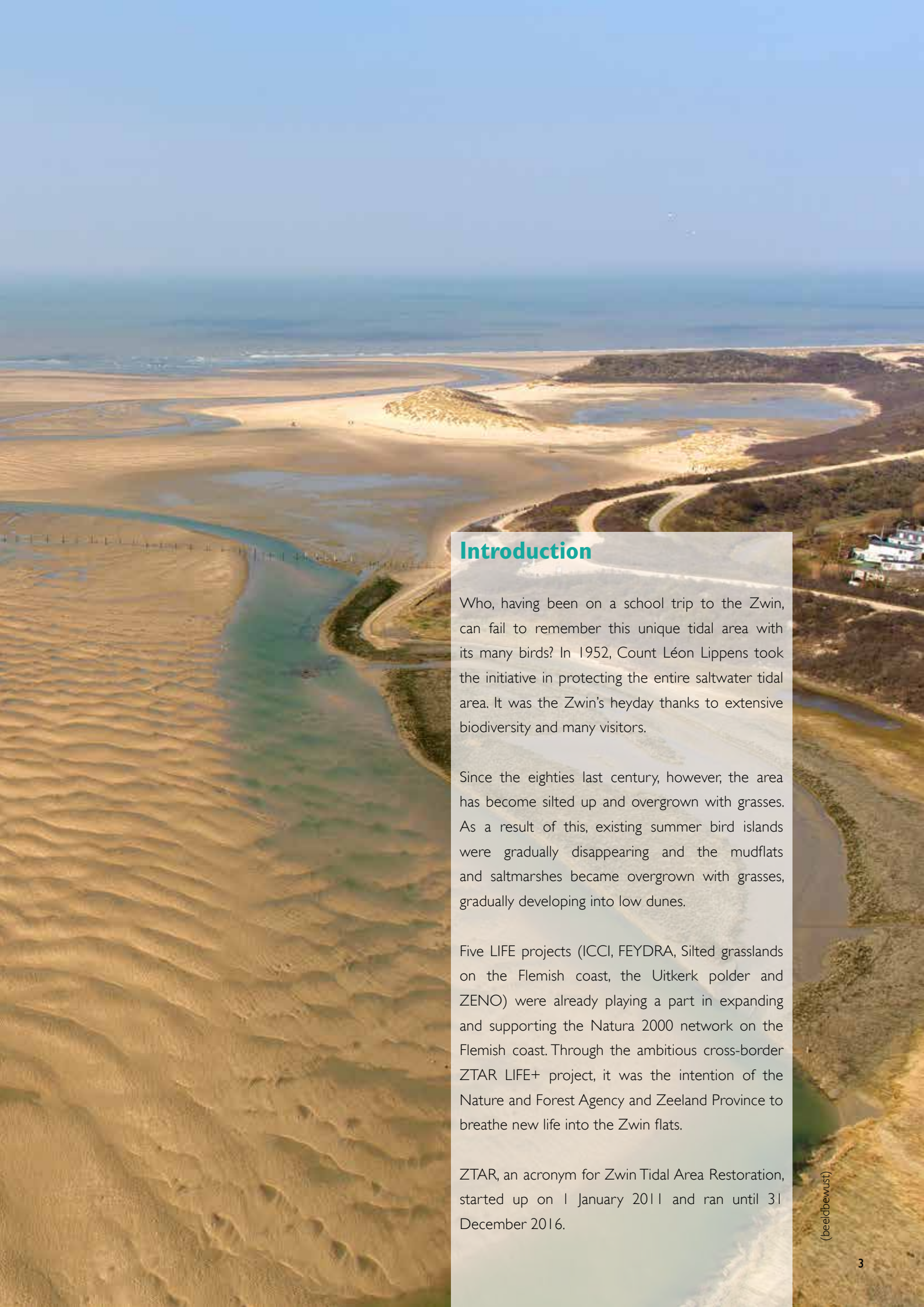
### Chief Administrative Officer

Koning Albert II laan 20 Bus 8,

B-1000 Brussels

### Cover photo:

widening and deepening the Zwin Channel  
[toont.be](http://toont.be)



## Introduction

Who, having been on a school trip to the Zwin, can fail to remember this unique tidal area with its many birds? In 1952, Count Léon Lippens took the initiative in protecting the entire saltwater tidal area. It was the Zwin's heyday thanks to extensive biodiversity and many visitors.

Since the eighties last century, however, the area has become silted up and overgrown with grasses. As a result of this, existing summer bird islands were gradually disappearing and the mudflats and saltmarshes became overgrown with grasses, gradually developing into low dunes.

Five LIFE projects (ICCI, FEYDRA, Silted grasslands on the Flemish coast, the Uitkerk polder and ZENO) were already playing a part in expanding and supporting the Natura 2000 network on the Flemish coast. Through the ambitious cross-border ZTAR LIFE+ project, it was the intention of the Nature and Forest Agency and Zeeland Province to breathe new life into the Zwin flats.

ZTAR, an acronym for Zwin Tidal Area Restoration, started up on 1 January 2011 and ran until 31 December 2016.



*The Zwin before ZTAR*

## The Zwin: cross-border tidal area

The Zwin is part of the North-west European coastal dunes and extends over some 213 hectares. The area consists of a Flemish and a Dutch part, with around 180 hectares on Belgian territory (Knokke-Heist municipal district), and some 33 hectares on Dutch territory (Sluis municipal district).

This nature area boasts around 2.3 kilometres of coastline and is enclosed by dunes and a high dike (the International Dike), which was built in 1872. There is a natural breach in the chain of dunes at the Belgian-Dutch border over a length of around 250 metres. A large volume of water flows from the North Sea via this sea inlet into the nature reserve at every high tide. This volume is dependent on the height of the tide and the wind direction. The Zwin channel branches off in the area into smaller creeks, through which the saltwater spreads into the nature area. The water drains off again as the tide goes out. Due to this tidal inflow, we refer to the Zwin as an intertidal zone.

The daily inflow of seawater endows this nature area with an extraordinary flora and fauna which is hardly ever found elsewhere on the Dutch-Flemish coast. The saltwater creates a unique biotope: mudflats

and saltmarshes. What is more, the salty creeks and pools, dunes in various stages of development and characteristic dune and silt grasslands create a varied mosaic.

The Zwin forms a single cross-border nature area with the Zwin nature park, the Zwin grasslands the Zwin dunes and polders nature reserve. The Nature and Forest Agency restored the characteristic dune biotopes in the last-named area between 2006 and 2010 thanks to ZENO, a European LIFE nature project. You can find more info at [www.natuurenbos.be/zwinduinen](http://www.natuurenbos.be/zwinduinen) [in Dutch].

At a European level, the Zwin constitutes an essential link in the Natura 2000 network of European nature areas ([www.natura2000.vlaanderen.be](http://www.natura2000.vlaanderen.be) and [www.natura2000.nl](http://www.natura2000.nl)) [both in Dutch]. It is Europe's intention with the Natura 2000 programme to bring the decline in nature areas to a halt. The Zwin lies in both the 'Het Zwin' Special Protection Zone (European Birds Directive 79/409/EEC) and the 'Dunes including IJzermonding and Zwin' Special Protection Zone (European Habitats Directive 92/43/EEC).

On the Dutch side, the Zwin has been designated a special protection zone by the Zwin and Kievitte polder Designation Decree under the Habitats Directive and

(Misjel Decleer)



*Common Tern with young*

(Misjel Decleer)



(Misjel Decler)

Sea lavender on the saltmarsh

the Birds Directive. The area has also been designated the Zwin and Kievitte polder Natura 2000 area, which adds conservation objectives. The expansion of the Zwin has also been provisionally designated a Natura 2000 area in the Netherlands.

These Special Protection Zones, dubbed SPZs for short, are designated to give European protected habitats and species a chance to survive sustainably in order to maintain and strengthen European biodiversity.



(Misjel Decler)

Little Egret



(toont.be)

New dam and access bridge



## History of the Zwin flats

The creation of the Zwin channel dates back to the 12th century, when a superstorm blew a hole in what was then the dune belt. This incursion by the sea created a channel which runs via Sluis to today's Damme. This channel became the access to the sea for Bruges, which brought great prosperity to the city thanks to the cloth trade among others.

However, reclamation works started immediately to reclaim the lost land from the sea, and the tidal area began to shrink visibly. This brought about a drop in the dynamism of the tidal system the Zwin silted up, which made it ever narrower and shallower, which had a major economic impact on Bruges and Damme.

Witness the maps drawn by Mercator in the 16th century and Count de Ferraris in the 18th century, the tidal area continued to shrink down the centuries due to land reclamation and the silting up associated with it. In 1872 the International Dike was built around the intertidal zone in order to hold the sea back permanently from the land. The Zwin thus acquired its current shape

and surface area, developing into a delightful nature area. The international Zwin commission was set up with representatives in 1949 with representatives from the various stakeholders from West Flanders and Zeeland. The intertidal area became a private estate in 1952, founded by Count Léon Lippens, thus protecting this unique natural environment. A bird park was also established, enabling visitors to get close to bird species typical of the area outside the dike.

Since the eighties in the last century, the natural environment values and hence the associated visitor numbers dropped off substantially. Various factors were at the root of this. Increasing silting up resulted in the mudflats and saltmarshes being washed over less often by the tide.

The Zwin channel got smaller and narrower, which meant that less and less water came in. Mudflats and saltmarshes silted up and became areas of monotone littoral vegetation growth. Storms and erosion opened up a new channel and created a direct link to the



**Scanned black and white photo of shepherd with flock of sheep in Het Zwin, presumably shortly after WW II. An ongoing ethno-ecological study (Zwaenepoel & Vandamme, 2014) has revealed that this is the shepherd Gustaaf Voet, on his way to Het Zwin with a flock of sheep belonging to the farmer Vandepitte (Knokke). Voet worked as a shepherd for the Vandepittes between 1932 and 1945.**

western saltwater pool via an existing small excavated channel. This gave rise to a problem since the water level in this area was being kept artificially high via a flap dam in order to create a number of breeding islands. Because of the dam, the water was able to come in as the tide rose, but could not escape as the tide went out. This created large pools with small islets. The newly opened up northern channel bypassed the dam, which meant that the water was no longer retained in this area. There were various attempts made down the years to fill in the channel, but it just kept on opening up again.

In 2003, after a great deal of preparatory work, the International Zwin Commission set out development measures aimed at preserving the Zwin sustainably. The main recommendation was to expand the Zwin with part of the Willem-Leopold polder. This recommendation laid down the basis for the Zwin expansion which started back in 2016 and for which preparations were started in 2005 by the Flanders-Netherlands treaty.

The expansion of the Zwin was also included in the Scheldt Estuary 2030 Long-Term Vision approved in 2002 in order to contribute to conservation objectives in Flanders and the Netherlands. It figured in the Scheldt Estuary 2010 Development Outline in which both countries agreed that the Scheldt Estuary must be made safe, accessible and natural. The Zwin project thus contributes to sustainable conservation of the Scheldt Estuary.

Compagnie Het Zoute decided in 2006 to sell the Zwin. The Zwin flats were acquired by the Flemish government's Nature and Forest Agency and the bird park was placed in the hands of West Flanders province. On the Dutch side, it is owned and managed by the Dutch State and the Zeeland Countryside Foundation [Stichting Het Zeeuwse Landschap] respectively.

# Cross-border collaboration

The expansion of the Zwin is a complex cross-border project that is being monitored by the Flemish-Dutch Scheldt Commission (VNSC, its Dutch acronym). The expansion of the Zwin is being driven on Flemish side by the Flemish government's Agency for Maritime and Coastal Services and Nature and Forest Agency. On the Dutch side, it is being driven by Zeeland Province. Coordination between the Netherlands and Flanders takes place via the Zwin monthly consultation, where the three drivers sit around the table with the VNSC and with the Dutch Ministry of Economic Affairs. In administrative terms, coordination is conducted through the International Zwin Commission.

The Flanders Environment Agency (VMM, its Dutch acronym), the Flanders Land Agency (VLM, its Dutch acronym) and the East Coast Polder are also involved as project partners via a framework agreement. They coordinate the agriculture policy that covers it and are working on the watercourses in the area surrounding

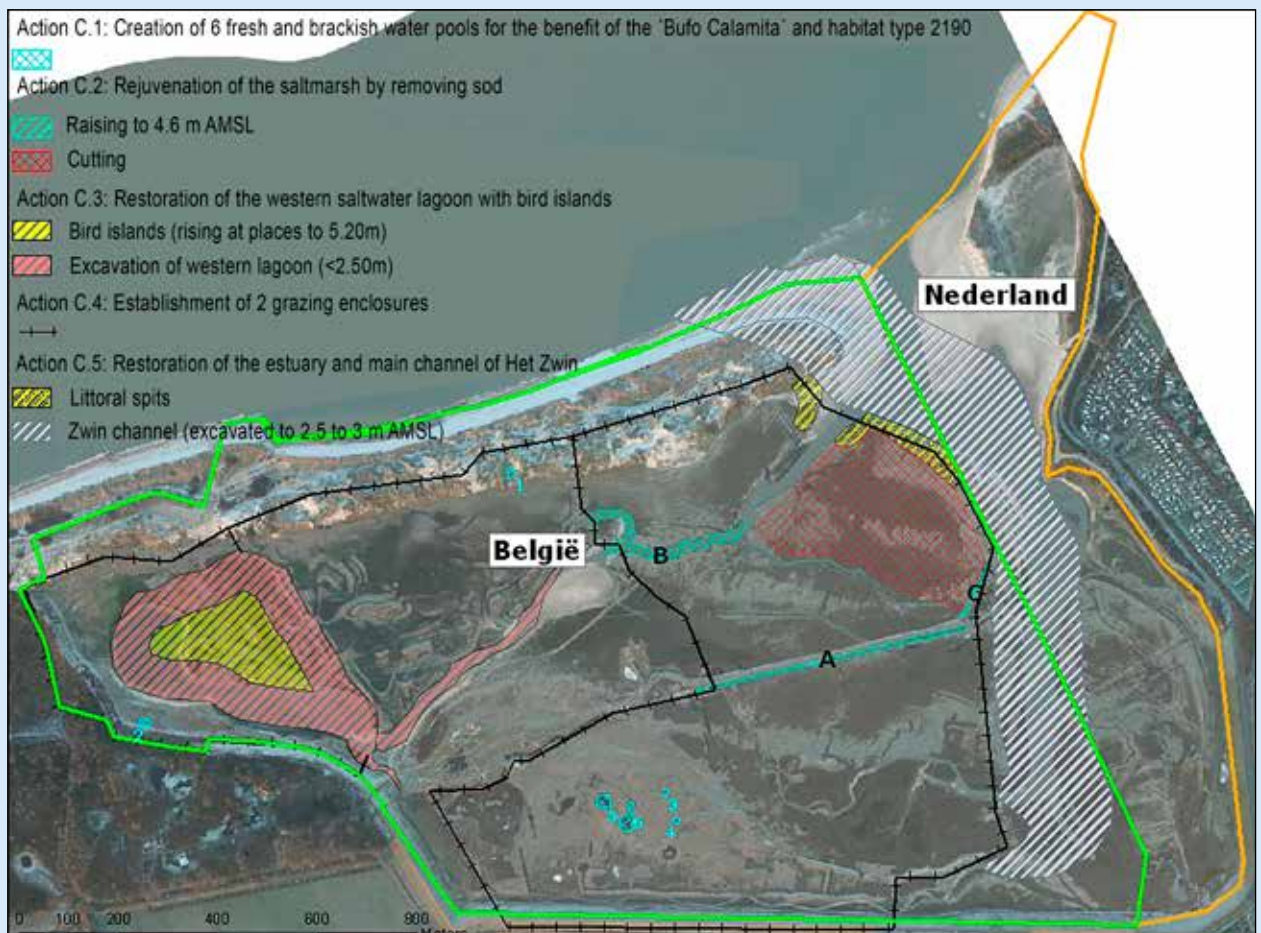
the Zwin. They are assisted by 7 organisations: Zeeland Countryside Foundation, Scheldt Streams Waterscape, the Dutch Ministry of Economic Affairs, Rijkswaterstaat, the executive organisation of the Dutch ministry of Infrastructure and the Environment, West Flanders Province, Knokke-Heist and Sluis municipal authorities. They all make an important contribution to a sustainable and great future for the Zwin area.

The Zwin is managed on the Flemish side by the Nature and Forest Agency, on the Dutch side it is down to the Zeeland Countryside Foundation.



(Piet Lozie)

## The various actions within the LIFE+ nature project ZTAR





## Project objectives

The threat to the Zwin was clear: because of the silting up of the channel connecting the nature area with the North Sea, valuable mudflats and saltmarshes were disappearing, along with native animal and plant life.

The main objectives of this project were the restoration of a number of important types of habitat and increasing the natural dynamism of the system. The restoration works were aimed at bringing back a number of European protected species such as little terns, common terns and avocets to the Zwin, and have them breeding there.



(Piet Lozie)

Another objective was communicating with visitors and neighbouring residents and exchanging knowledge and experience gained with European nature conservationists. Various information sessions, exhibitions, folders, a website, on-site notice boards and an international conference informed the wider public about the importance of the Zwin and the restoration works. The Zwin is a renowned nature reserve which attracts visitors in large numbers. That is why accessibility and experience facilities were evaluated by creating a management plan for the area. The challenge was to have many people visit the Zwin at the same time as restoring and preserving this prime European natural environment.

Sustainable nature management was also the aim after the works. A management plan was drawn up for the Flemish part in the course of the ZTAR project, consistent with the cross-border vision (2014). The works described in it must ensure that the valuable species and habitats in the Zwin are also preserved for the future.

## Concrete nature restoration activities in LIFE+ ZTAR

### I. Restoration and creation of fresh and brackish water pools



(Piet Lozie)

*New pool*

Fresh and brackish water pools make up the propagation biotope for the rare natterjack toad (*Bufo calamita*) and contain habitat type 2190 'humid dune slacks'. The natterjack toad occurred in the Zwin area up to the 1980s. Due to the fact that the few overgrown dune pools disappeared, this species suffered a sharp decline and ultimately ceased to occur in this region.

An effort was made by setting up new propagation pools in 2011 to bring back this particular species. Since it became clear from monitoring that there is no remaining population to be found any longer in or near the Zwin, possible introduction from neighbouring populations was investigated. This revealed that the populations on the west coast had sufficient genetic diversity and that there were enough specimens in those populations to move a number of natterjack toad spawn strings, breed them and let them out in the Zwin. Following preparations in 2016 the natterjack toad is expected back in the Zwin area in 2017-2018.



## 2. Rejuvenating the saltmarsh



(beel/bewust)

*Rejuvenated saltmarshes*

Due to years of silting up, increasing areas of the saltmarsh were raised to a higher level. This made it difficult for typical mudflat and saltmarsh plants to become established. In order to give these valuable species another chance, a 10-hectare area was cut to a depth of around 20 centimetres in 2013. This cutting consists of removing the top nutrient-rich layer of soil. This enabled the mudflats and saltmarshes to be rejuvenated by tidal action and gave plants such as annual sea-blite, glasswort and sea lavender a chance to spread. Numerous bird species such as avocets, oystercatchers and redshanks were also soon observed coming to feed on the nutrient-rich mudflats. This area is certainly full of all kinds of waders in the spring tide season as birds migrate.

## 3. Restoration of the breeding islands



(Piet Lozie)

*Creating breeding islands*

The breeding islets in the northwest corner of the Zwin flats disappeared as a result of the newly opened up channel, the dam falling into disuse and

the silting up of the Zwin. The fox population grew steadily, increasing the likelihood of predation during the breeding season. The supply of seawater therefore needed to be improved so islands could be created. That was achieved successfully in 2013 by filling in the northern inflow channel and installing a new adjustable dam in the main channel at the same time.



(Piet Lozie)

*Brooding Mediterranean and black-headed gulls*

Because the side channel has been filled in, the seawater must now travel a longer distance before reaching the saltwater pool. This means that sand sedimentation occurs mainly in the inflow channel and less so at the bird islands.



(Mistjel Decler)

*Summer bird islands*

The adjustable dam enables us to control the water level at the breeding islands. The water is kept higher (4.15 m AMSL) during the breeding season in order to discourage predation on the bird islands by ground predators. The gates are removed outside the breeding season and the water level is fully dependent on the tides. While the works were being carried out, the excavation for the dam was blocked off and pumped out. This meant that work could be carried out in the dry, which made excavation easier. The excess sand was then taken away to the Netherlands where it was used to reinforce the dunes.

It was some time before the first breeding birds appeared, but avocets, common terns and little terns were breeding again on the islands two years after the works. More and more species came to breed in larger numbers in subsequent springs. Thus, in 2016 birds breeding on the islands included 830 pairs of black-headed gulls, 190 pairs of Mediterranean gulls and 366 pairs of common terns. What you would call a successful operation! The vegetation on the islands is removed regularly in order to maintain their suitability for these target species.

#### 4. Sustainable management of the Zwin



(Mijel Decler)

*Limousin cattle in the Zwin*

Two large grazing enclosures were erected in 2014 to enable the restored vegetation to be managed sustainably. Sheep graze in the westernmost enclosure, while cattle give nature a helping hand in the largest grazing block. These grazing animals have been chosen

based on historic data and on environmental grounds. Until about halfway through last century, the Zwin flats were grazed by flocks of sheep with a shepherd and cattle from farmers in the surrounding area.

Grazing animals have a major impact on the development of vegetation. Cattle have been brought in since 2007 for nature management on a small part of the Zwin flats. During that period a positive trend could already be observed: the dominance of littoral growth was broken up by cattle grazing, which gave other plants a better chance.

Cattle grazing brings about a small-scale mosaic of lower and higher vegetation. This varied structure constitutes an ideal habitat for numerous (small) animals, thus substantially increasing diversity.

Periodic grazing by flocks of sheep ensure that the valuable characteristic vegetation is maintained on the dikes. A dike rich in species can thus develop. Sheep are also happy to nibble on woody plants and are therefore the most suitable means of cutting down excessive shrub growth.

#### 5. Widening and deepening the Zwin channel



(Piet Lozie)

*Archaeological examination, bunker WOII*

The silting up of the Zwin channel meant less and less water flowing into the Zwin flats. As a result, the water had less power to carry enough sand with it out to sea as it flowed away from the Zwin flats. What is more, this reduced dynamism in the channel accelerated the silting up process.



(Misjel Decleer)

*Excavating western dune*

The channel was widened and deepened in late 2016 and early 2017 under the LIFE project. This will enable a great deal more seawater to flow in faster at high tide. Conversely, this will be followed by a more powerful flow back out to sea. This increased dynamism ensures that less sand is left behind, thus slowing silting up. Due to the fact that the ground level of the valuable



(Misjel Decleer)

*Works in Zwin channel*

saltmarsh vegetation will remain more or less constant in this way, it will allow the desired vegetation to develop better. In addition to this, in the near future (2019) the channel in the expanded Zwin will be extended, which will ultimately allow three times as much seawater to flow in and out.

*Works in Zwin channel*



(Misjel Decleer)



(© "MDK, Coastal & Hydraulic Engineering Laboratory department)

Zwin expansion

## Cross-border expansion of the Zwin

The Zwin will also be enlarged concurrently with the implementation of the LIFE+ project. As much as 120 hectares will be added, of which 10 hectares are in the Netherlands. As a result of the expansion of the tidal area, which runs up until 2019, over and above the widening and deepening of the channel, there is an added volume of water available to add to the power of the outgoing tide and further reduce silting up. We are increasing coastal safety at the same time. The lion's share of the core of the new dike around the expanded cross-border tidal area is being built with the sand from the channel, amounting to 450,000 m<sup>3</sup>. Once the expansion is complete, we will actually be protected against a storm which, according to calculations, will occur once every 4,000 years.

Visitors will be able to enjoy the unique expanded Zwin flats more than ever, thanks to new recreational footpaths and cycle tracks, viewing points and visitor centres. Further information about these developments can be found at <http://zwinverandering.eu/en/>.



Common Shelduck

(Mijiel Decker)

# Communication and exchanging information

Major works in the Zwin flats sometimes resulted in reduced accessibility. Information notices were always posted to inform visitors when work started. These panels contain information about the works, the results desired from them and future images. During walks around the site, interested parties were able moreover to see from close at hand how the works were progressing and what exactly was being done. At the start of the project, everyone was made most welcome at an information evening which took place on 23 October 2011. Around three hundred people were in attendance.

In addition to this, various press sessions were organised. The press conference at the cutting of the first sod by the minister responsible was well attended. The press session on the occasion of the visit by a European Commission delegation and in which the first sheep were let loose in the Zwin was also able to attract due attention.

The progress of the works was recorded in four short films that explained what was intended with the

various activities on the site. These short films are being disseminated via various media and can be viewed at the [www.lifenuatuurztar.be](http://www.lifenuatuurztar.be) website [mostly in Dutch, some information in English]. This website also contains all the information about the project and is updated regularly with text and pictures of operations and activities. Press releases and other announcements are also being published on this website.

An international conference was held to bring the project to a close. The results of the measures adopted were shown to a specialist audience from at home and abroad. Other projects were also presented. In addition to this, various topics, such as ecosystem services, nature management in estuarine areas and climate change were discussed. The results and contributions from this conference have been compiled and are available in digital format at the ZTAR website.

Apart from these activities, the project was also explained during public events in and around the Zwin, such as *Zwin inside out* and *Zwin on stilts*.



Minister Joke Schauvliege, Minister Ben Weyts and Representative Carla Schonknecht

(Régine Vanallemeersch)



(beeldbewust)

*Fine aerial view*



## First results and conclusions

As with previous LIFE nature restoration projects on the Flemish coast, this project, which ended on 31 December 2016, more than fulfilled expectations. The plants and animals that are characteristic of the area are back in large numbers and in spring the birds cheer on the work completed. Visitors to the Zwin flats are also enthusiastic about the result. With the gradual return of breeding birds and plants in flower, they can enjoy the splendour of yesteryear to the full once again.

In addition to nature restoration, European projects add particular value to the dialogue between the various parties which are active or involved in the project area. This has strengthened the bond with local authorities further and brought about cross-border cooperation with the Dutch agencies concerned. The good progress of the works is attributable to regular coordination and intensive cross-border cooperation.

This is how the ZTAR project and the expansion of the Zwin succeeded in meeting and preserving the European aims for nature.

The nature restoration and conservation works in and around the Zwin are not therefore finished. Further work on the expansion of the Zwin will be continuing until 2019. At that point, the Zwin will extend over 333 hectares and will combine with the surrounding nature areas to form a 600-hectare nature area of prime European natural environment.

Outside this area there is also a full commitment to the conservation and development of accessible nature in the Zwin region. Accordingly, humans and wildlife are looking forward to a fine future here.

Would you like to find out more or do you have any further questions?

If so, please visit [www.lifenatuurztar.be](http://www.lifenatuurztar.be)

or contact:

Agentschap voor Natuur en Bos

Koning Albert I laan 1.2, Bus 74

B-8200 BRUGES

02 553 81 02

[www.natuurenbos.be](http://www.natuurenbos.be)

