

# DUNES IN POLAND

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# INTRODUCTION

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Extensive sand dunes occur along the coast of Poland in the southern Baltic. These have developed since the middle of the Holocene extensive modification by human action has taken place over the last 2,000 years. Natural or almost natural dune processes and sand accumulation on the coast occurs in only a few places, starting from the East: Vistula Sandbar near outlet of the Vistula River, cape of the Hel Peninsula, some parts of the Łebska Sandbar and two thirds of the Świna Gate Sandbar

# TYPES OF DUNE

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There are approximately 35,000ha of dune on the 464km of the Polish coastline (428km and 36km of the Hel Peninsula). Sand dunes make up 80% of the coastline of Poland with short sections of eroding cliff in between. Coastal currents and the prevailing wind influence the direction and amount of transported material and hence the orientation of the dunes along the coast. There are two main types of the dune coast:

1. those built by sandy dunes, mostly moving landward due to erosion of the foredune;
2. dunes where a typical dune ridge is not present, and shores build seaward or along the coast as sandy barriers. Some of these are still accumulative coasts

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Grey dunes are fixed, stable sand dunes that are covered by a continuous layer of herbaceous vegetation. These dunes are typically located 50–100 meters from the ocean shore and are found on the landward side of foredunes (also known as yellow dunes). Grey dunes are named for their characteristic grey color which is a result of the ground cover of lichen combined with a topsoil layer of humus.

White dune - a type of seaside dune, mobile, in the first stages of stabilization covered with poor vegetation, without soil-forming services. Due to the stabilizing role as a rhizome-root system of plants inhabited it, the website is designed to transfer the wind rather than the central part, so a form of a parabolic dune was created.



# THE TRANSITION ZONE BETWEEN THE WHITE (RIGHT) AND GRAY (LEFT) DUNE. SLOWINSKI NATIONAL PARK.

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# MOVING DUNES AT SLOWINSKI NATIONAL PARK

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# The Czołpińska dune

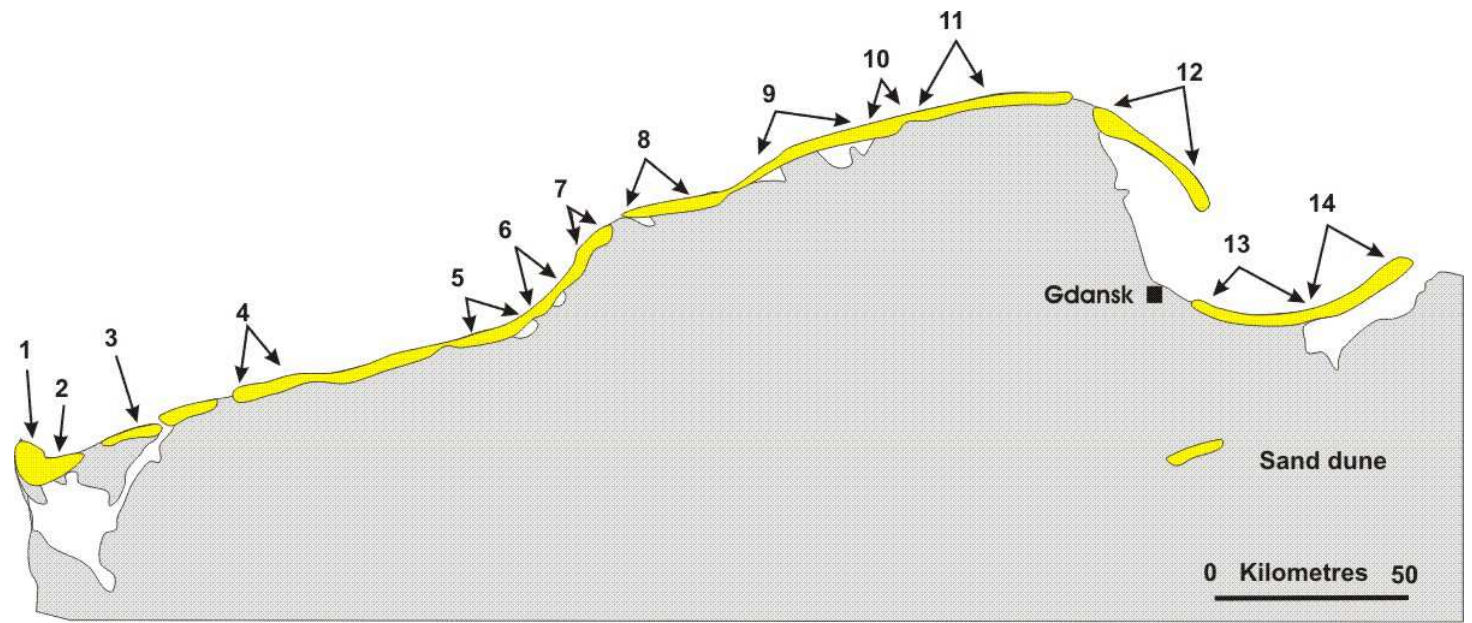
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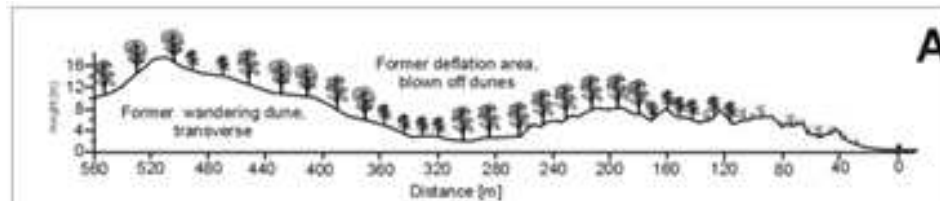
SITE NAME		LENGTH (km)	SIZE (ha)	OTHER HABITAT	STATUS
1.	Karsibor Bar (Swina Gate Sandbar)	3.5	1000	Saltmeadow, alderwood	-
2.	Przytor Bar (Swina Gate Sandbar)	12.5	2500	Saltmeadow, alderwood, wetland	partly Natura 2000
3.	Dziwnow Bar	11	380	Alder/mixed wood, lakes	-
4.	Niechorze-Mrzeszyno	16	1500	Meadow, mixed wood, lake (NR)	-
5.	Mrzeszyno-Kolobrzeg	22	1300	Meadow, saltmeadow, peat bog	partly Natura 2000
6.	Lake Jamno Bar	18	450	Meadow, lake	-
7.	Lake Bukowo Bar	10	100	Lake	Natura 2000
8.	Lake Kopan Bar	10	120	Alderwood, lake	-
9.	Lake Wicko Bar	15	1500	Alderwood, meadow, lake, peat bog	-
10.	Łeba Bar	34	4450	Alder/birchwood, lake	NP, BR, Natura 2000
11.	Sarbska Bar	8	800	Lake	NR, Natura 2000
12.	Lubiatowo	26	2600	Meadow, peat bog	half LP, Natura 2000
13.	Hel Spit	36	3100	Bay, reedbed	LP, Natura 2000
14.	Vistula Delta	4	800	Meadow, reedbed, wetland	NR, Natura 2000
15.	Vistula Bar	48	6000	Meadow, reedbed, wetland	LP, Natura 2000

Table of important sand dune sites in Poland.

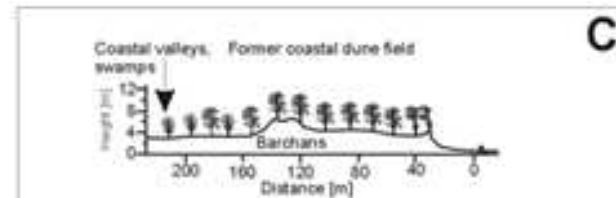




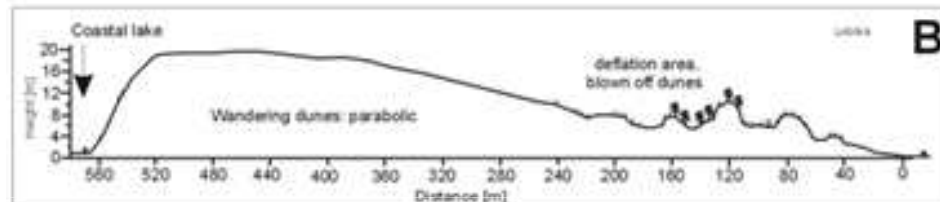
Map of sand dune distribution of mobile foreshore, sand dunes and important sites in Poland



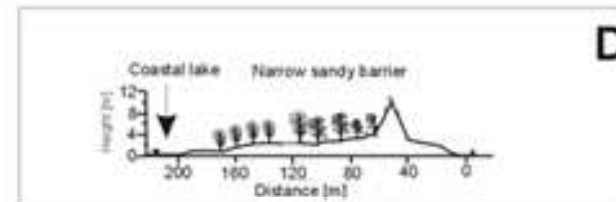
Wide dune barrier. Still accumulative coast. From 200 to 2000 m dune area with stabilised dune ridges with runnels or stabilised formerly wandering dunes or seldom blown dunes. Behind lake, swamps or low lying area.



Narrow barrier. Mostly erosive, ephemeral foredune. Sometimes without coastal ridge. Up to 200 m flat area or covered by stabilised dune hillocks (barchans). Behind flat area: valleys, swamps.



Wide dune barrier. Still accumulative coast. Sand mostly transported into the hinterland where wandering dunes arise. From 200 to 2000 m dune area with stabilised or wandering dunes parabolic, barchans with deflation hollows or coastal ridges with runnels. Behind lake, swamps or low lying area.



Narrow barrier 80-300m wide. Mostly erosive, ephemeral foredune. Mostly with one coastal ridge, retreating in land. Behind narrow ridge area covered by stabilised dune hillocks. Behind lakes or swamps.

Prevailing types of Polish dune coasts and their dynamics. A- accumulative coast with foredunes and fixed transverse dunes. B- accumulative coast with foredunes and moving parabolic dunes, C- erosive coast without foredune, D- narrow erosive sandbar with retreating foredune

# FLORA

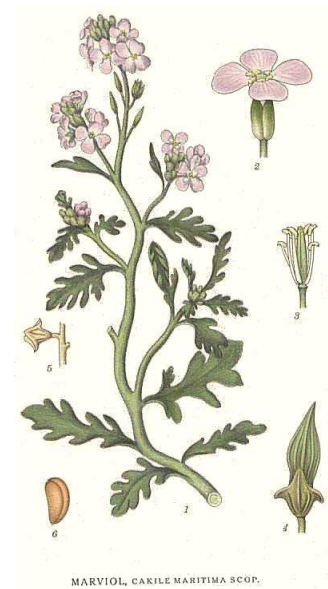
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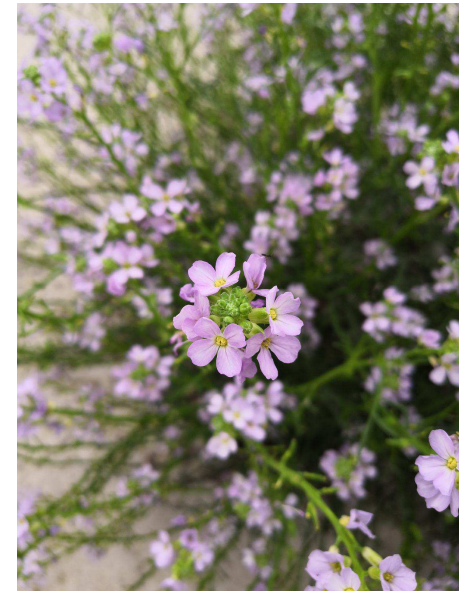
Hippophae  
rhamnoides  
rokitnik  
zwyczajny



Honckenya peploides  
honkenia piaskowa



Cakile maritima ssp. baltica  
rukwiel nadmorska bałtycka





# FLORA



Mikołajek nadmorski  
*Eryngium maritimum*



Kocanki piaskowe  
(*Helichrysum arenarium*)



# FLORA



Bażyna czarna (*Empetrum nigrum* L.)



*Ammophila arenaria*  
piaskownica zwyczajna





# FLORA

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*Carex arenaria*  
turzyca piaskowa



*Leymus arenarius*  
wydmuchrzyca piaskowa



Rozchodnik ostry (*Sedum*  
*acre* L.)

# FAUNA

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Biegus rdzawy  
(*Calidris canutus*)



Mewa srebrzysta  
(*Larus argentatus*)



Jaszczurka zwinka  
(*Lacerta agilis*)



# FAUNA

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Żmija zygzakowata (*Vipera berus*)



Żuraw  
zwyczajny (*Grus  
grus*)



# FAUNA

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Ropucha szara  
*Bufo bufo*



Rzęsorek mniejszy  
(*Neomys milleri*)



Zajac szarak (*Lepus europaeus*)

# ENVIRONMENTAL PROTECTION OF COASTAL DUNES ON THE POLISH COAST

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- National Parks - There are two national parks on the Polish Baltic coast. Słowiński National Park, located on the eastern coast between Rowy and Łeba, it covers 34 km of the spit and dune shore. Has been created in 1967 in order to preserve the natural system of coastal lakes and marshes, peat bogs, meadows, coastal forests and forests, but mainly for protection moving dunes.
- Nature reserves are, next to national parks, one of the more restrictive forms of nature protection. They are excluded from use and human interference areas intended for the purposes of nature protection and scientific research. The entire area of the reserve or its parts may be under strict protection, active or only landscape. Access to areas covered by this form of protection is much limited. This allows environmental processes to develop naturally and the conservation of plants and animal habitats. There are 8 nature reserves on the coast, which in their tasks of protection include coastal dunes, in full or only additionally: Ptasi Raj, Mewia Łacha, Mechelińskie Łąki, Beka, Helskie Wydmy, Widowo, Mierzeja Sarbska, Dunes between Dźwirzyne and Grzybowo

# ENVIRONMENTAL PROTECTION OF COASTAL DUNES ON THE POLISH COAST

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The above-mentioned forms of protection - reserves and national parks, are located also in areas protected under EU directives - Natura 2000. Each of the separated areas also includes the protection of dune habitats, which, due to their location and pioneering operation, are considered the environment extremely valuable and endangered on a European scale. Natura 2000 areas were adopted by committee decision. They have been prepared for the dune areas designated in Poland protection plans. The prepared documentation was used to define the tasks of protection approved under the orders of the Regional Director for Environmental Protection in Szczecin or Gdańsk. Every 3-4 years, monitoring is carried out on selected one's positions. The species composition is determined based on the adopted monitoring method indicators and thus the overall condition of the habitats inside these areas.