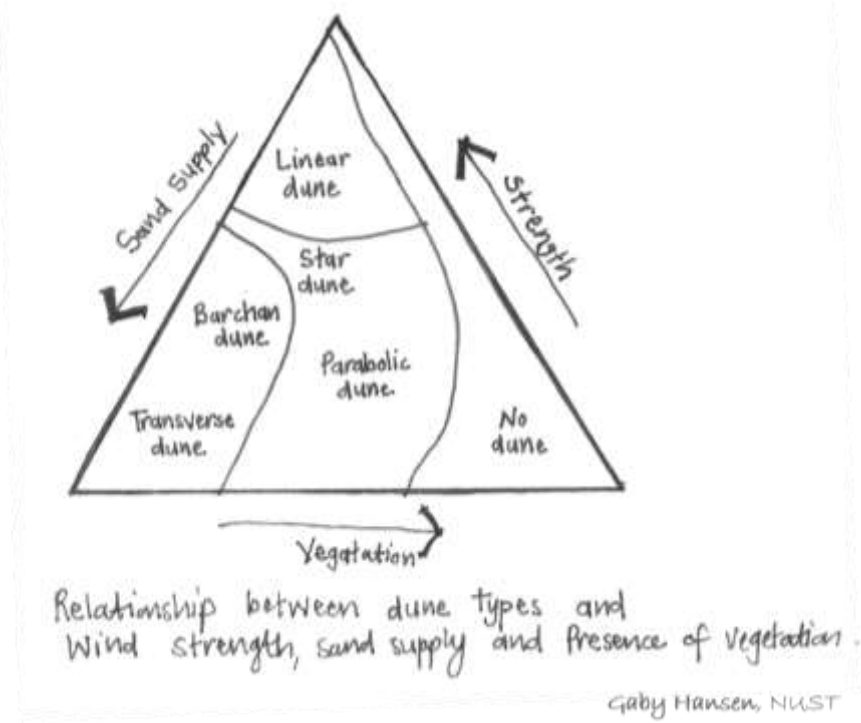
DUNE TYPES

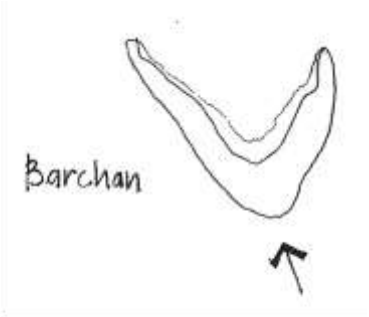
by Marina Coetzee

Dune type depends on wind strength and direction, sand supply, soil moisture and the presence or absence of vegetation.



BARCHAN (CRESCENT) DUNES

Highly mobile crescentic barchans develop where wind is uni-directional or narrowly bi-directional, sand supply low, precipitation very low and the ground surface fairly level. The sand advances at a rate that is roughly inversely proportion to the height of the crest, which means that the dune flanks move faster than the centre. Barchans thus move in the direction of the forward-facing horns that outstrip the bulk. The slip-face is on the forward-facing, concave side.



Short trains of barchans appear north of the Huab, Hoanib and Hoarusib River mouths and the lower Khumib and Sechomib Rivers and peter out where there is an insufficient supply of sand. Barchan dunes coalesce into transverse dunes at the southern and eastern margins of both the Skeleton Coast and Kunene Ergs.

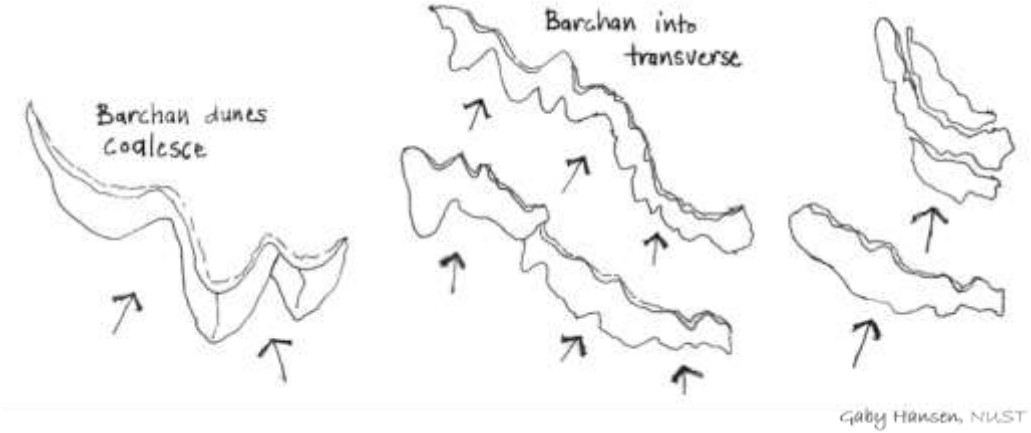

Small groups of barchans north of the Huab (left) and Khumib (right) *(Bing Aerial)*



North of the Koigab and Engo Rivers, individual barchans join up to form transverse dunes *(Bing Aerial)*

TRANSVERSE DUNES

Where sand is more plentiful and wind uni-directional, barchans join up into transverse dunes. Their long axes are more or less perpendicular to the wind direction.

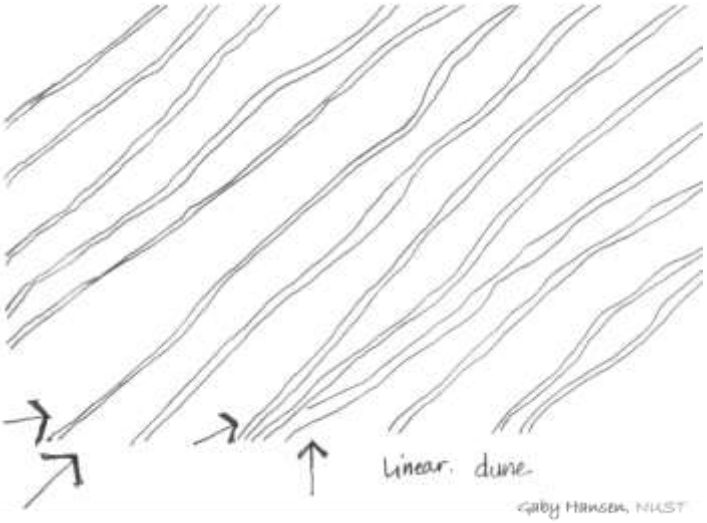


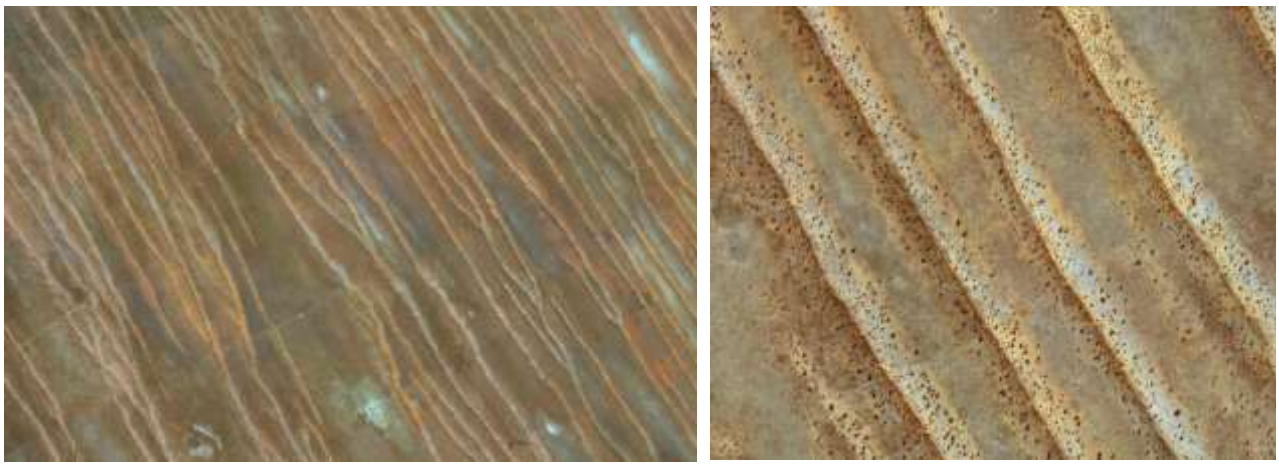
Transverse dunes are the most abundant dune type in the Skeleton Coast and Kunene Ergs. Their orientations are mainly NW – SE to WNW – ESE.

Transverse dunes
(Bing Aerial)

LINEAR (LONGITUDINAL; *SEIF*) DUNES

Linear dunes are straight or slightly sinuous symmetrical sand ridges. They form where sand is abundant and wind bi-directional, with one wind direction somewhat dominant. Wind pressure is more or less the same on both sides of the dune. Linear dunes are aligned lengthwise between the two wind directions. Inter-dune areas may be gravelly or sandy.





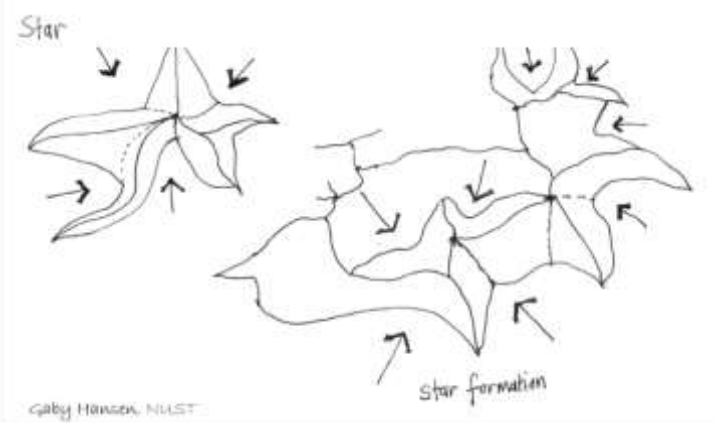
Linear dunes from the Kalahari *(Bing Aerial)*

The Skeleton Coast does not have simple linear dunes like those of the Kalahari, but rather linear dunes overlain by more recent transverse dunes.

Complex linear dunes overlain by more recent transverse dunes, in the Kunene Erg *(Bing Aerial)*

STAR (PYRAMIDAL; *GHOURD*) DUNES

Star dunes form where wind is multi-directional – at least from 3 directions – and sand plentiful. They have sharp points and ridges, and at least 3 slip-faces. Splendid examples can be found in the Namib Erg around Sossusvlei, but they do not occur in the Skeleton Coast National Park.



Star dunes from Sossusvlei area *(Bing Aerial)*

PARABOLIC DUNES

The depositional lobe (the convex 'nose') on the downwind side leads forward movement, while the trailing 'arms' bracket a deflation basin. The slip-face is on the downwind, convex side of the parabola. Parabolic dunes form where dampness or vegetation suppress sand motion and slow down the arms, while the centre advances downwind. They do not occur in the Skeleton Coast.

A few poorly-defined parabolic dunes march across the Kuiseb Delta *(Bing Aerial)*

STOSS AND SHADOW DUNES

Stoss dunes are low-angled sand ramps forming upwind of obstacles such as rock outcrops, while shadow dunes form in the lee of obstacles, are thicker and usually have well-developed crests.

VEGETATED HUMMOCK DUNES

(*Nebkhas* / *Nabhkah*, Shrub-Coppice Dunes)

Plants (e.g. *Salsola*, *Zygophylum*, !Nara, *Arthraerua*) disrupt wind flow, causing deposition of sand on the lee side. Hummocks grow over time as plants grow upwards to escape the encroaching sand. In the fog zone, the exposed positions of these plants help with fog-harvesting. Plant material and windblown detritus accumulate, creating small ecosystems with characteristic desert wildlife such as insects and reptiles, some of which are endemic. Vegetated hummock dunes occur along the entire coastline in a long, intermittent chain parallel to the coast, east of the

littoral zone. This provides a discontinuous S – N migration route along the coast.

Birth of a hummock dune *(Marina Coetzee)*

Plant-covered hummock dune *(Don Cowen)*

Detritus accumulation *(Marina Coetzee)*

!Nara hummock *(Alma Moller)*

Salsola hummocks *(Bing Aerial)*

Salsola hummocks *(Marina Coetzee)*

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