

# Dune System Restoration in Osório Municipality (Rio Grande do Sul, Brazil): Good Practices Based on Coastal Management Legislation

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## Abstract

Dune Management Plans are useful tools to integrate coastal development, dune conservation and even dune restoration. The environmental legislation of Rio Grande do Sul (South of Brasil) establishes a Permanent Preservation Area of 60-m minimum width that should be protected in the coastal dune systems. This study shows the implementation of a coastal management plan in Osório Municipality (N of Rio Grande do Sul) for the restoration of the foredune. The analysis of previous evolution (1997–2010) of the dune field showed widths lower than the legal requirement and decreasing in the last years. Then, a dune restoration plan was designed and implemented in 2011. The measures included the planned retreat of the road located back the foredune, channelization of the northern washout's mouth with a structure under the foredune, installation of sand fences and control of the pedestrian accesses to the beach by both a pathway and a footbridge. Finally, efficiency of the management plan was assessed by monitoring (2011–2016) the foredune evolution, which permitted to conclude a satisfactory result. Only the foredune sector close to the washout' mouth did not achieve the expected minimum width, but it can be considered acceptable considering its higher sedimentary dynamics, the inherent difficulties of these structures and the short monitoring period from the implementation of the plan.

Key Words: Dune Management Plans, foredune, South of Brasil