



Monitoring geo-biodiversity interactions of a restored inland drift-sand cell in Nieuw Bergen (Li)

Pieter Dirk Jungerius (1), Hanneke van den Ancker (1), Andries Arts (3), Ido Borkent (4), Rita Ketner-Oostra (5), and Pieter Ketner (5)

(1) Stichting Geomorfologie en Landschap, Oude Bennekomseweg 31, 6717 LM, Ede, Netherlands, (2) Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam, P.O. 94248, 1090GE Amsterdam, NL, (3) Gemeente Bergen (Li), Gemeenteloods, De Flammert 1028, 5854 NA Nieuw Bergen, NL, (4) Stichting De Marke, Waaldijk 24, 6677MB Slijk-Ewijk, NL, (5) Freelance ecologist, Algemeer 42, 6721 GD Bennekom, NL

In 2002, a research was carried out by Jungerius, van den Ancker, Ketner-Oostra and Evers to see if it was possible to restore active inland drift-sand areas in National Park De Maasduinen in Nieuw Bergen, Limburg. The active drift-sand had completely disappeared from the area by nitrogen-rich precipitation. It was decided to try and restore the activity depicted on the first aerial photographs in 1933, if soil profile development and Natura 2000 species allowed this. The areas stabilized since then were overgrown, dominantly by the invasive moss *Campylopus introflexus*, a species introduced to the Netherlands by tanks during World War II. Areas colonized by Natura 2000 lichens were spared as centres for re-colonization. The research gave insight in the elongated geomorphological cell-structure of the original drift-sands and the rate of soil development after stabilisation.

In 2005, the first active drift-sand cell was restored by increasing the erodibility of the terrain, by mechanically removing the sod and up to 5 cm thick soil formed since 1933, and increasing the erosivity of the wind by removing trees, mainly in the upwind direction. In 2008 a second cell was restored, and a third one in 2011.

A monitoring programme was set up for the first cell to improve our understanding of stabilization and geodiversity-biodiversity interactions in drift-sand areas. Lines of erosion pins were monitored at regular intervals for a five year period. Aerial photographs made in 2005 and 2008 showed the pattern of stabilization of the moving sand. The poster will present the results of these experiments.

In 2012, five years after the restoration, the active drift-sand cell was stable again and had turned into an open dry grassland, almost completely dominated by the Natura 2000 species *Corynephorus canescens*. Unfortunately several of the areas that were spared as centres for re-colonization of Natura 2000 lichens lay in the sand transport zone and had acted as sandtraps, and most Natura-2000 species had disappeared from these areas.

Discussion and recommendations

From the Natura-2000 viewpoint the restoration measures were very successful as the terrain now classifies as habitat type 2330. Different views exist on how to further manage the terrain. One view is to try and create a steady-state situation by regularly removing part of the *Corynephorus canescens* vegetation and having an active erosion- and transport-zone while further increasing the erosivity of the wind by removing more trees. Another view is to let succession have its way, and see which species appear in the course of succession. As cells in successive stages are now available, we propose to test the different views and proceed with the monitoring of the terrains.

Reference

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