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### Evaluation of ecological services of Populus simonii forest on Heerqin sandy land (PMID:14986346)

[Zhang H, Li F, Zhang T, Zhao L, Yasuhito S](#)

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[Ying Yong Sheng tai xue bao = The Journal of Applied Ecology / Zhongguo Sheng tai xue xue Hui, Zhongguo ke xue Yuan Shenyang  
Ying Yong Sheng tai yan jiu suo zhu ban](#) [2003, 14(10):1591-1596]

Type: Journal Article, Research Support, Non-U.S. Gov't, English Abstract (lang: chi)

Abstract

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The main ecological services of the sand-fixed forest are windbreak, soil erosion control, and atmospheric dust retention. In this paper, the ecological services of Populus simonii forest were assessed by simultaneous measurements of wind speeds, daily amount of soil surface wind erosion, and amount of atmospheric dust deposition at different observation sites located within and outside the forestland. The results showed that compared with the control site (mobile sand dune), the daily mean wind velocity at 2 m height was reduced by 18.3, 31.6, 66.1, 66.0, 62.3 and 45.2% for the observation sites over the distances of 6 and 3 H (H meant average tree height) from forest edge of the windward side, forest center, and observation sites over the distances of 0, 6 and 8 H from forest edge of the leeward side, respectively. The greatest reduction in daily mean wind velocity was occurred in both forest center and forest edge of the leeward side. There was a significant positive relationship between leaf area index of the forest and monthly declining index of mean wind speed. The monthly declining index of mean wind speed increased with increasing the forest leaf area index by a cubic function. The daily wind erosion rates of soil surface in observation sites at 6 and 3 H from forest edge of the windward side, forest center, and at 0, 6 and 8 H from forest edge of the leeward side were reduced by as much as 85.2%-99.9%, in comparison with the control site. The greatest reduction in daily wind erosion rate of soil surface occurred in forest edge of the leeward side, followed in decreasing order by forest center, 6 and 8 H from forest edge of the leeward side, 3 and 6 H from forest edge of the windward side. During the observation period,

the daily mean dust deposition within the forestland was 13.2 kg.hm<sup>-2</sup>, compared with 9.9 kg.hm<sup>-2</sup> outside the forestland, with a 33% increase. All these results suggested that the poplar forest played an important role in reducing damaging winds, controlling wind erosion, and improving the local environment through increasing atmospheric dust deposition.

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