

论文

道路绿地消减噪声服务功能研究——以北京市为例

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摘要:

在城市化带来的环境问题中,噪声已成为影响城市居民身心健康的主要因素之一,而配置合理的绿地对噪声具有明显的降低作用。论文从绿地消减噪声的机理出发,基于实验测定结果,结合绿地斑块调查数据,对北京市城区道路绿地降噪效果及其价值进行了研究。结果如下:①不同组成结构的道路绿地降噪能力不同,其中乔灌木结构道路绿地降噪能力最强,其次为乔木类和灌木类,草坪类最差,各类型绿地降噪能力均随宽度的增加而增加;②北京市城区道路绿地年降噪 $9.35 \times 10^7 \text{ dB(A)} \cdot \text{a}^{-1}$ ,其中乔灌木结构绿地占92.95%,单位面积道路绿地平均降噪 $20\ 477 \text{ dB(A)} \cdot \text{hm}^{-2} \cdot \text{a}^{-1}$ ,其中乔灌木结构绿地最高,为 $23\ 505 \text{ dB(A)} \cdot \text{hm}^{-2} \cdot \text{a}^{-1}$ ,分别是乔木类的2.92倍,灌木类的17.92倍,草坪类的18.64倍;③北京市城区道路绿地消减噪声的年价值为 $7.13 \times 10^8 \text{ 元} \cdot \text{a}^{-1}$ ,单位面积道路绿地降噪价值为 $156\ 033 \text{ 元} \cdot \text{hm}^{-2} \cdot \text{a}^{-1}$ 。研究表明,北京市城区道路绿地结构搭配较为合理,在消减噪声方面发挥了重要作用,具有可观的生态效益。

关键词: 消减噪声 道路绿地 生态系统服务 北京市

Research on Noise Reduction Service of Road Green Spaces—A Case Study of Beijing

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Abstract:

Among the environmental problems caused by urbanization, noise has become one of the major factors affecting seriously both physical and psychological health of the urban residents. It was found that the green spaces with reasonable allocation had an obvious effect on noise reduction. This paper studied the noise reduction effect and value of urban road green spaces based on the mechanism of noise reduction of green spaces and the results of the noise monitoring experiments, combined with the survey data of green patch. Results were as follows: 1) The noise reduction effect of green spaces differs because of its different structure: the trees-shrubs-grasses strongest, then followed by trees and shrubs, and grasses the worst. Moreover, the noise reduction effect of each kind of the green spaces grows along with the width. 2) The annual quantity of the noise reduction of urban road green spaces was  $9.35 \times 10^7 \text{ dB(A)} \cdot \text{a}^{-1}$  in Beijing, and the trees-shrubs-grasses contributes the most, that is 92.95%. The average quantity of the noise reduction of urban road green spaces per unit area was  $20477 \text{ dB(A)} \cdot \text{hm}^{-2} \cdot \text{a}^{-1}$ , and the trees-shrubs-grasses still was the largest, being 2.92 times of the trees, 17.92 times of the shrubs and 18.64 times of the grasses. 3) The annual value of the noise reduction service provided by urban road green spaces was 713 million yuan  $\cdot \text{a}^{-1}$ , and the average value per unit area was  $156033 \text{ yuan} \cdot \text{hm}^{-2} \cdot \text{a}^{-1}$ . The results showed that the structure of urban road green spaces was reasonable in Beijing, and had played an important role in the noise reduction with considerable ecological benefits.

Keywords: noise reduction road green spaces ecosystem service Beijing

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