

URBAN LAKE FUNCTIONS IN ECOSYSTEM AND LANDSCAPE BUILDING IN BEIJING CITY

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Abstract

The Beijing city will hold 2008 Olympic Game, which is to be a green Olympic and People's and Cultural Olympic. Many lakes in the urban area of Beijing City are to be restored and rehabilitated. For water engineers working in Beijing, it is obliged to design lake restoration projects according a principle with multifold considerations, such as flood-control, eco-environment and landscape, which involve establishing a complete and balanced land-aquatic eco-system of land, lake-bank and lake-water, in order to build healthy lakes. The paper analyzes the current situation of urban lakes in Beijing and discusses the lake's roles in ecosystem restoration and landscape building. Most lakes in Beijing are man-made and artificially harnessed. Lake banks can be classified as 5 types in terms of materials, i.e. soil bank, rock and stone bank, concrete bank, wooden bank and composite bank. The lakes in Beijing play mainly two kinds of function: for landscape and scenic spots and for multipurpose of water uses. Many famous lakes have been the carriers of cultural marks and historical relics, as landmarks of the city, like Beihai Lake and Kunming Lake in Summer Palace. Some lakes are also for flood detention in rainy season and storing treated sewage water.

Comparing with rivers, lakes are easier to be deteriorated due to its small flow velocity and low exchange rate of water body. In order to have ecologically reasonable lakes, lake banks are to be designed and rehabilitated according a principle involving multi-factors in ecology, environment, aesthetics, landscape and engineering. The eco-system in lake waters includes terrestrial plant, hygrophyte, aquatic plant and aquatic animals. The authors put forward a concept of ecological buffer zone, which is an interim belt between lake and land. Inside a well composite ecological buffer zone, lots of physical, chemical and ecological processes are taking place. It will form a perfect and balancing lake eco-system.

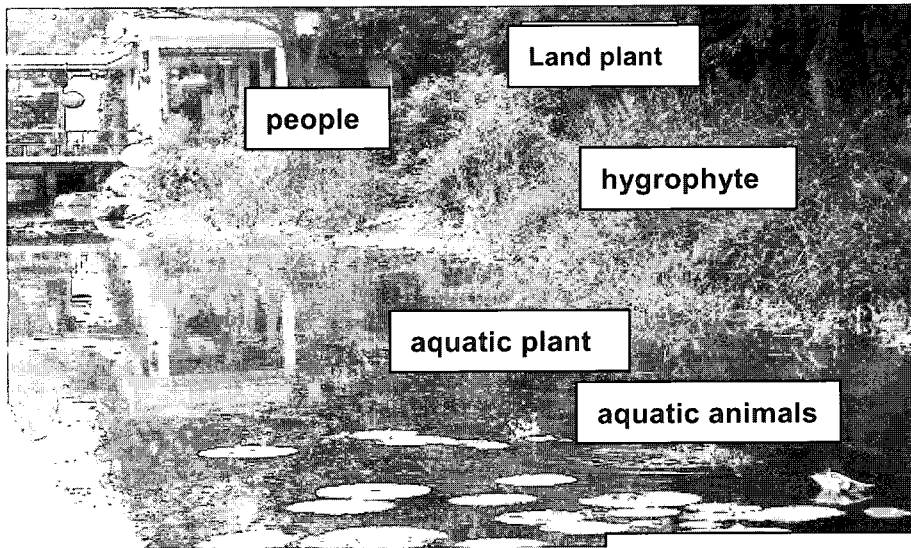
The water surface must be made green by scientifically planting. The work of greening water surface involves restoration of aquatic ecosystem in natural waters, establishment of aquatic flora in artificial lakes, improvement of ecosystem in whole lake, and building healthy lakes. It is indicated that greening water surface should be managed in the same way of pruning lawn in streets and gardens.

The water plant can also have values in landscape and aesthetics. Chinese people have long history of paying attention to the aesthetic function of lake and water plant. Many descriptions of beautiful lakes with water plant surrounded can be found in ancient poems and literature.

The paper lists a table of appearance and features of water plant in Beijing. The water

plant flowers bloom at different time, in various colours and in inflorescence. By means of careful designing, the lake banks with water plant would play tri-fold function: eco-environmental function of bio-system balance, engineering function of wave prevention for banks and aesthetical function of beautiful landscape.

Some suggestions are brought about for urban lake restoration and rehabilitation: deepening research on methodology, theory and conception; greening water surface; designing ecological buffer zones on lake banks according to realistic needs and practical condition; taking comprehensive measures of water pollution prevention, sewage treatment, urban flood utilization etc.



A perfect lake ecosystem

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