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**XVIII INTERNATIONAL SCIENTIFIC
AND PRACTICAL CONFERENCE
«Innovations in Scientific
Research: World Experience
and Realities»**

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SECTION: GEOGRAPHY

FUNCTIONAL FEATURES OF LANDSCAPE DESIGN IN THE "SERET" MODEL

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Relevance of research. Using modern methods of biotechnology, it is possible not only to study the quality of natural waters in certain areas of riverbeds, but also to contribute to the improvement of their quality. Introducing modern biotechnologies with the use of certain types of aquatic plants and animals, the simplest using the example of the "Seret" model, we offer to improve the quality of natural waters, to form landscape-attractive recreational aquazones for public recreation. The "Seret" model is well structured, built with an individual landscape approach in the section of the Seret riverbed, it can be considered as a typical model for functioning in other sections of the Seret riverbed, or other small and medium-sized rivers to restore their biotic resource and improve the ecological condition

Such scientists carried out Bioecological studies of water bodies as O.G. Vasenko., V.I. Vyshnevskiy, V.V. Grebin, Y.V. Hryb, V.V. Hrubinko, H. Gumenyuk, V. D. Romanenko, V. K. Khilchevskiy, A. V. Yatsyk and others. Many provisions on the theory and practice of restoration of surface water quality require detailed study and revision.

Presenting main material. When implementing project decisions regarding landscape design in the Seret riverbed, we conducted a study of various landscape design concepts that will help us in creating a project, the purpose of which is to implement the "Seret" model, to improve the bio-ecological condition of the Seret River in Veliko Berezovytsia community. The width of the studied section of the river is 18-22 m, the depth is from 1 m to 1.2 m, and the length is 100 m

The specificity of landscape architecture and design is that the main means of creating compositions are natural elements: vegetation, relief and water, as well as

artificial (anthropogenic) - small architectural forms, geoplastics, water devices, decorative coating, etc. The combination of natural and artificial components of the environment in a complete composition that constitutes a certain artistic image is the main goal of creating objects of landscape architecture and design. In general, the priority in landscape architecture and design is the aesthetic factors of the formation of the natural environment. In our "Seret" model, landscape architecture should perform an important function of cleaning and restoring the natural state of water in the Seret River, and a recreational one - to provide a comfortable rest for vacationers on the territory near the riverbed [2].

Landscape compositions in landscape design are based on the maximum use of the beneficial characteristics of the environment, neutralising adverse factors in accordance with the requirements of agricultural technology. The objects of landscape architecture and design embody achievements in plant cultivation (ornamental horticulture, selection, introduction), the embodiment of architectural and engineering skills with the help of plants (construction, irrigation, etc.) [3].

The former model "Seret" is a landscape-style model that will solve a number of problems in a separate section of the Seret riverbed with the help of a biotic component. The constructed model is aesthetically pleasing for recreationalists and is able to perform an ecological function of restoring biota in the riverbed and provide biological water purification using hydrobionts. An affordable and effective way to protect and restore the river through planting trees, shrubs, and sowing herbs on the border of the water protection area is proposed. The composition and size of the plantations are recommended, which will prevent soil erosion, siltation of the stream, will delay a significant part of the surface runoff from the adjacent territories, slowing down its speed by almost 10 times, and increase the filtration field.

The choice of planting is chosen according to the functional purpose of the plants. These are as follows: water-protective and coastal-protective shoals, located directly along the riverbed, formed from moisture-loving shrubs and trees; soil-protecting meadow areas near the left bank of the river, created by multicomponent mixtures of cereals and leguminous grasses; drainage plantations on flooded areas (poplar and alder plantations are preferred) - along the right bank. The optimal design of the protective strip: several rows of trees (preferably at least three), lined with one or two rows of moisture-loving bushes on the river side, and 1-2 rows of hedges (for protection) on the opposite side. On the side of the river, the shrub layer should form a thick brush capable of withstanding ice damage to the bark.

Scientific hydrologists have proven that the ratio of natural or similar territories and economically modified lands in the total area of the catchment area is 1:1 (forest-steppe and steppe territories) or 2:1 (Polyssia, mountainous regions) that is best for the river. A river whose catchment area (or at least in its valley) maintains an optimal ratio of natural and modified territories has all the conditions for normal existence and revival [4].

The "Seret" model envisages a comprehensive reconstruction of the coastal areas of the Seret River, along the 100 m stretch of the riverbed, with the aim of creating an attractive and functional water landscape. To achieve this goal, careful planning and

design was carried out, including various elements to ensure water purification with hydrophytes and hydrobionts, comfortable recreation for visitors.

During the creation of a model using green plantations, environmental factors were studied from the point of view of their influence on plant growth, and such species were chosen that, under these conditions, would make the most of positive environmental factors. Plantations are characterized by sufficient growth, stability, will contribute to a comfortable microclimate and contribute to the restoration of the natural environment. When selecting the assortment of plants and placing them on land and in the water environment, the conditions of local growth are taken into account, which must correspond to the bioecological features of their development (local species). In our "Seret" model, representatives of various species are combined, which functionally correspond to the model.

When planting trees, the following features were taken into account: sanitary and hygienic possibilities (purification of air from dust, gases and noise), aesthetic appeal (color of leaves, shape of crowns, aroma), as well as the possibility of creating shade and areas for rest. We offer the following trees: Common catalpa (*C. bignonioides*), Common walnut (*Juglanus regia* L.), Western thuja (*Thuja occidentalis*), and Hanging birch (*Betula pendula*).

We offer the planting of aquatic plants (Fig. 1.) microorganisms, mollusks that contribute to the natural purification of water from pollutants.

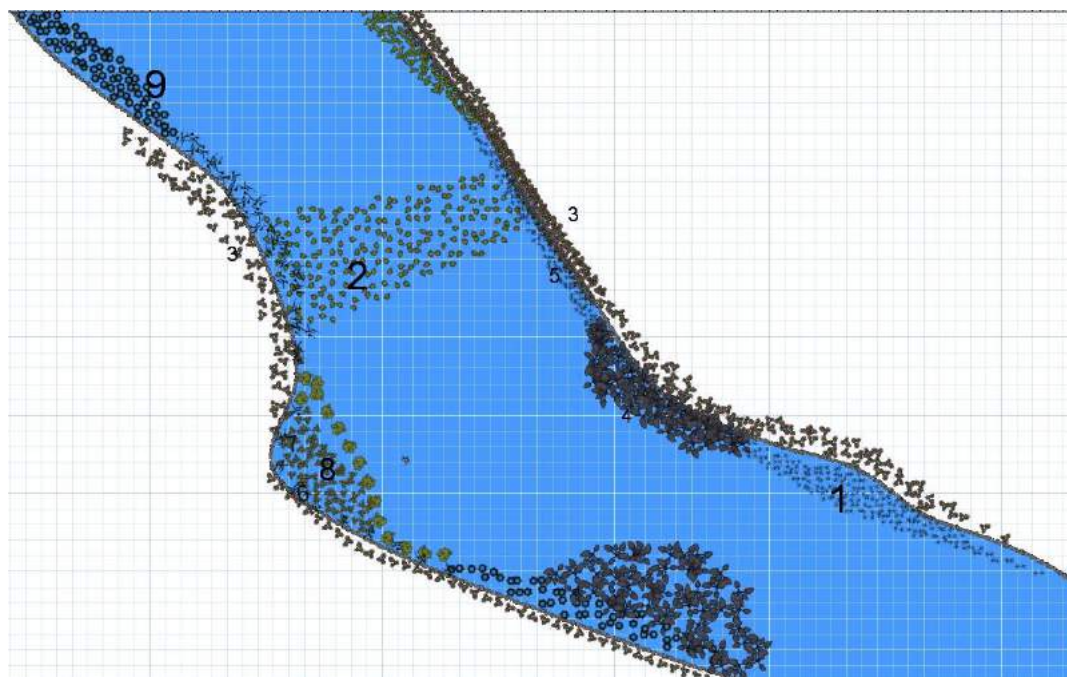


Figure 1. Plan for planting plants in the "Seret" model

1. Rogiz (*Phragmites australis*). 2. Callitriche, water star (*Callitriche*). 3. Alfalfa (*Medicago sativa*). 4. Rdesnuk (*Potamogeton* L.) 5. *Acorus calamus* (*Acorus calamus*). 6. Marsh grouse (*Iris pseudacorus*). 7. Marsh mudweed (*Caltha palustris*). 8. *Ranunculus aquatilis* (*Ranunculus aquatilis*). 9. *Juncus* (*Juncus* spp.)

We offer road surface reconstruction to improve environmental and aesthetic functions. Benches of various shapes have been installed for rest areas. Benches in the

recreation area are arranged according to the regular design style and zones for better viewing of the water landscape.

It is important to install effective and aesthetic street lighting that will allow visitors to enjoy the area in the evening and safety. Modern technologies are used to reduce the impact of anthropogenic factors on the environment. The "Seret" model is aimed at creating a harmonious coastal and water landscape that performs an aesthetic, ecological function, it is an attractive and comfortable environment for recreation.

Conclusion. One of the newest trends in the restoration of small rivers can be offered "flower gardens" in the areas of small riverbeds. It is possible to form and structure "flower gardens" near settlements, which perform various functions according to their purpose: recreation areas, water purification, restoration of natural ecosystems, etc.

The "Seret" model built by us has a landscape-style orientation, will provide a solution to a number of problems in a separate section of the Seret riverbed with the help of a biotic component. The model built by us is aesthetically attractive for recreationists and is capable of performing an ecological function of restoring biota in the channel area, providing biological water purification with the help of hydrobionites, moisture-loving plants.

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