

Research Trends and Results

Proposal for Enhancing River Environment Management

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1. Maximizing the information on river environment

In realizing the conservation and restoration of a beautiful and natural river environment, basic river environment information is mainly obtained from the biological surveys, called the National Census of the River Environment ("Census"), which is conducted every 5 years. A river environment information map is created by summarizing the Census data in a map. Such information has become available this decade and accordingly basic knowledge of the conditions of river environments in Japan has been increased. Therefore, efforts should be made to utilize such information and knowledge in the practical river management, with the aim of enhancing the effectiveness of management.

2. Issues in practicing environmental management and solutions

Generally, management consists of four items: monitoring and evaluating conditions, improvement measures, and target setting. As a result of applying this to the management of a river environment, issues and solutions in each item are considered as follows.

○ Issue 1 <Monitoring the conditions> Measuring the distribution / amount of habitat

In river environment management, not only living things but their habitats are generally taken into consideration. Particularly, for what regards river channel topography and vegetation, a good balance of flood control conditions, such as discharge capacity, and environmental conditions, such as good habitats, is needed, and is one of the targets in practical management.

For what regards physical habitats, neither a mechanism nor a survey method for periodically collecting data has been established, as in the Census, e.g., distribution or amount (e.g. area) of rapids and pools essential for fishes. For this reason, it is necessary to establish a mechanism for obtaining habitat data periodically.

○ Issue 2 <Evaluating of the conditions> Evaluating habitat quality

The quality of a habitat is evaluated by checking the inhabitation of living things under the Census against the condition of the habitat. Since the Census is conducted in typical areas, a method is required to evaluate the condition of habitats in other areas.

○ Issue 3 <Improvement measures> Providing technical information on improvements / management

For the river segments under the control of the national

government, technical information as to what approach is appropriate or should be avoided for eco-friendly river improvement / management is lacking. It may require steady efforts, but it is necessary to focus on collecting existing data for the locations improved as part of activities in Issue 1, and provide the obtained information.

○ Issue 4 <Target setting> Need further discussion

Many discussions have been made on setting targets but not yet reached a conclusion. Therefore, practical measures should be continued in order to maintain or improve the present situation for the time being.

3. Development of habitat evaluation methods

The NILIM, in collaboration with the MLIT, Regional Development Bureaus, and Public Works Research Institute, has been studying the aforementioned issues since last fiscal year. To represent our study, the following describes Issue 2. For Issue 2, studies are underway on the application of an approach (ecological niche model) for evaluating, based on habitat information, the appropriateness of a habitat as probable habitat for a certain type of organism (indicator species). This issue was studied using Census data on fishes and physical environment data on 1 km sections plotted in 2006 for the rivers under the direct control of the national government (Figure).

In the future, we will also study practical measures for Issue 2, using this kind of models.

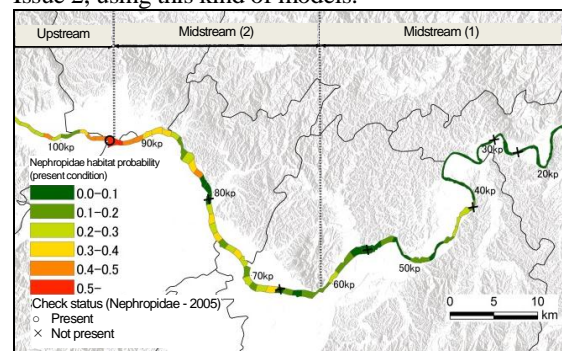


Figure: Example of Habitat Potential Evaluation with Ecological Niche Model