

## ECOSYSTEM SERVICES EVALUATION: PROTECTED AREAS AND CULTURAL HERITAGE SITES

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Protected areas and cultural heritage sites provide essential benefits, most of which are externalities and have no market prices. This results in underestimating such territories, so protected areas and cultural heritage sites are traditionally considered as less competitive compared to other alternatives. Besides, underestimation of ecosystem services causes ineffective management, social conflicts and declines efficiency of environmental policy and heritage protection programs.

Protected areas and cultural heritage sites can occupy essential part of a country and perform several functions (such as biodiversity conservation, education, science research, population recreation and heritage protection), including provision with ecosystem services nearby areas. Researches in protected areas' ecosystem services evaluation show that such services have significant economic value and in some cases are essential for local communities' welfare as for Russian as for world protected areas. The same is true of cultural heritage sites and especially of territories that combine both natural and cultural importance. In addition such areas are legal entities, so there are huge opportunities for them to be suppliers on ecosystem services' markets.

To solve the problems and get on ecosystem services markets protected and cultural areas have to identify and evaluate full range of ecosystem services.

The method of protected areas and cultural heritage sites assessment includes ecosystem services evaluation. Ecosystem services evaluation technique is based on the Millennium Ecosystem Assessment' classifications and concept of Total Economic Value. It should be mentioned that the services provided by ecosystems depend on the type of ecosystem, geographic location and extent of human intervention. The author selects main components of protected area or cultural heritage site (architecture complex, forests, wetlands, other ecosystems) for each of which services are listed. After that all elements should get economic values. Approaches to the assessment of these components may vary depending on the information available and the conditions of the assessment. Evaluation techniques include market prices, hedonistic pricing, replacement costs, changes in productivity and other techniques. Finally total value may be discounted according to the aims of assessment.

Suggested method was applied to evaluate ecosystem services of National Park "Lake Pleshchevo" (Russia, Yaroslavl province). The park is functioning since 1988. Nearby Pereslavl-Zalessky, an ancient town with historical and cultural importance, is located on the Pleshchevo's bank and was a part of protected area till 1998. National park covers 23 772 ha of which 5 080 ha are Pleshchevo lake and 15 271 ha are forest area.

Ecosystem services were identified for following major ecosystems: the lake, forests and marshes. The lake provides such services as fishery, water supply and tourism (direct use value). Indirect use value of lake includes recreation, flood prevention and habitat for wildlife. Direct use value of forests contains timber after forest maintenance logging, wild berries, forest mushrooms and tourism and indirect use value of forests is presented by carbon sequestration. Ecosystem services of marshes include wild berries, forest mushrooms, tourism, flood prevention and habitat for wildlife and cleaning services.

The services of direct use value are estimated by local market prices and tariffs. Techniques for evaluation of indirect use value' components are varying. Carbon sequestration is valued by carbon market prices. To evaluate water cleaning functions substitute goods technique is used. Other evaluations are made by extrapolation of data obtained from research by K. Schuyt and L. Brander.

Figure 1. shows the structure of ecosystem services' economic value.

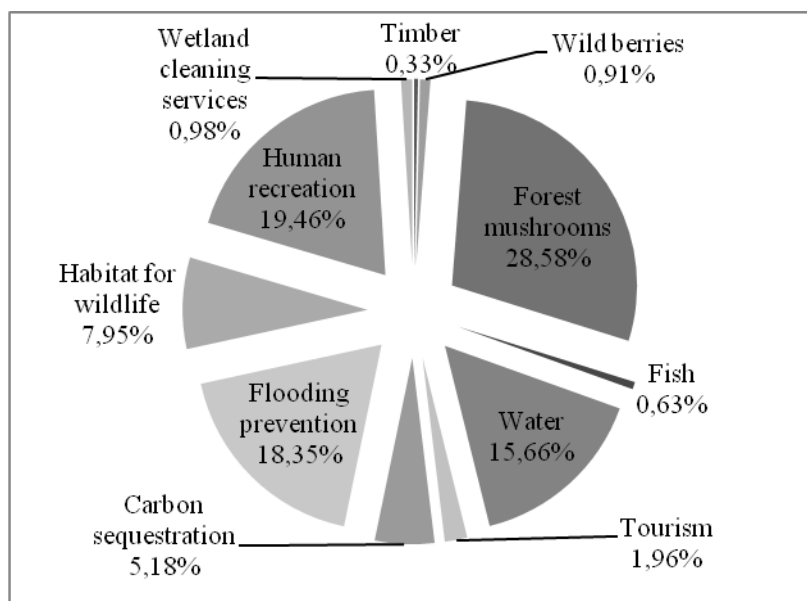


Figure 1. Economic value of "Lake Pleshchevo" ecosystem services, %

The value of ecosystem services provided by the National Park varies between 9562.3 and 12019.3 thousands euro, 4972.1 thousand of which are regulating services.

Combined with cultural and historic values of Pereslavl-Zalessky National Park "Lake Pleshchevo" provides significant benefits as for local as regional and countrywide communities.

**References:**

1. Annual information reports by Director of National Park 'Lake Pleshchevo', RF Ministry of Natural Resources, 2007 and 2008.
2. Schuyt, K., L. Brander. The economic values of world's wetlands. Gland/ Amsterdam, January 2004