Jan Evangelista Purkyně University in Ústí nad Labem

Faculty of Environment

Study material

LANDSCAPE, BIODIVERSITY AND CLIMATE

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Aims

Aims: Students will deepen to the expert level the current state of knowledge in the field of theoretical and applied ecology, relationships between organisms and the environment, including the context of evolution. They will get acquainted in detail with the methods of determining biodiversity, including the mathematical apparatus in the background and practical calculations. Issues of local and global climate, its formation and change will be discussed. The student will understand the role of diversity of organisms and landscapes and their integration into the concept of ecosystem services and get acquainted with the main procedures for increasing the ecological stability of the landscape. The aim of the applied part is to acquire the knowledge needed to assess the degree of biodiversity disturbance and fulfillment of ecosystem functions of the landscape and to design a way of managing and protecting the landscape, including the necessary revitalization measures to enable sustainable use of the cultural landscape.

Study topics

1. Ecosystems, ecosystem functions and ecosystem services.

2. Biodiversity, methods of estimating its state, biodiversity indices.

3. Types of diversity; diversity of organisms and landscapes at different spatial levels; the role of biodiversity in the fulfillment of basic ecosystem functions (production, evapotranspiration, water theory) in the landscape.

4. Fragmentation and landscaping as the main current causes of permanent biodiversity loss; possibilities of revitalization of biodiversity in natural, close to nature and unnatural habitats.

5. Climate, climate, weather, variability, changes, trends, global and local factors affecting climate.

6. Prediction of changes in land use and threats to biodiversity and fulfillment of basic ecosystem functions in conditions of climate change using modeling.

7. Possibilities of increasing the ecological stability of the cultural landscape and revitalization of anthropogenically formed segments of the landscape (leaving to spontaneous development, controlled succession, reclamation) and their impact on biodiversity.

8. Indicators of the effectiveness of revitalization measures in terms of biodiversity conservation and the provision of ecosystem services.

9. Recommendations for landscape planning to support biodiversity from the point of view of precaution.

10. Case studies (global, local).

Study literature

VAN ANDEL, J., ARONSON, J. Restoration Ecology: The new frontiers. Malden: Blackwell Publishing Ltd., 2012.

PERROW, M. R., DAVY, A. J. (eds.) Handbook of ecological restoration. Cambridge: Cambridge Univ. Press, 2002.

GILLSON, Lindsey. Biodiversity conservation and environmental change: using palaeoecology to manage dynamic landscapes in the Anthropocene. Oxford: Oxford University Press, 2015. ISBN 978-0-19-871304-3.

GARDNER, Robert H., Robert V. O'NEILL a Monica Goigel TURNER. Landscape ecology in theory and practice: pattern and process. New York: Springer, c2001. ISBN 0-387-95123-7.

LÖW, J. a kol. Rukověť projektanta místního územního systému ekologické stability. Brno: MZP, 1988.

PRIMACK, R. B., KINDLMANN P., JERSÁKOVÁ J. Úvod do biologie ochrany přírody. Praha: Portál, 2011.

SKLENIČKA, P. Základy krajinného plánování. Praha: Vydavatelství Naděžda Skleničková, 2003.