

Abstract

Potentials of alley-cropping systems as protection against wind erosion in the agricultural landscape of Brandenburg, Germany

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The goal of this study was to develop a database that could facilitate easy analysis of breeding bird monitoring data, to review environmental data storage and conservation in Germany and to investigate the relationship between species diversity and landscape structural elements.

Breeding bird data, collected on 65 observation areas in the years 2005 and 2006 for Brandenburg and 70 in 2006 for Baden-Württemberg, was pre-processed and normalized resulting in five tables.

The tables were then created in the Microsoft Access software, valid data types as well as primary and foreign keys were assigned to the fields in the tables in order to facilitate connections between the tables for data selection. The database was made user friendly by designing a graphic user interface (form) to facilitate data entry and retrieval. A detailed description of how such a database could be implemented on the web was given. The bird data from Brandenburg was queried from the database and then combined with spatial data extracted from the biotope classification, using 1 km² grids in GIS. Eight landscape variables found within the 1 km² observation areas were computed in addition to the number of patches per observation area. An exploratory factor analysis with a Kaiser-Meyer-Olkin measure of sampling adequacy of 0.6 and a significant Bartlett's test value at $\alpha = 0.05$ reduced the eight variables to two factors (average patch size and amount of linear structures) which accounted for 66.9 % of the total variance.

A correlation analysis between number of species types, average patch size, amount of linear structures and number of patches revealed, that there were significant correlations between number of species types and average patch size ($r = 0.22$, $N = 63$, $p < 0.05$, two tails) as well as between number of patches ($r = 0.31$, $p < 0.001$, two tails) respectively.

These relationships are of vital importance in assessing species diversity on a regional scale. Ecologically they can be used to determine the amount of suitable habitat for species under consideration, the functional connectivity between habitat types and policy formulation in regard to biodiversity conservation and land use planning.

Keywords: Biodiversity, bird monitoring, database, exploratory factor analysis, Kaiser-Meyer-Olkin measure of sampling adequacy, correlations Bartlett's test of sphericity