

EUNIS Habitat Classification: Expert system, characteristic species combinations and distribution maps of European habitats

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Abstract

© 2020 The Authors. Applied Vegetation Science published by John Wiley & Sons Ltd on behalf of International Association for Vegetation Science. Aim: The EUNIS Habitat Classification is a widely used reference framework for European habitat types (habitats), but it lacks formal definitions of individual habitats that would enable their unequivocal identification. Our goal was to develop a tool for assigning vegetation-plot records to the habitats of the EUNIS system, use it to classify a European vegetation-plot database, and compile statistically-derived characteristic species combinations and distribution maps for these habitats. Location: Europe. Methods: We developed the classification expert system EUNIS-ESy, which contains definitions of individual EUNIS habitats based on their species composition and geographic location. Each habitat was formally defined as a formula in a computer language combining algebraic and set-theoretic concepts with formal logical operators. We applied this expert system to classify 1,261,373 vegetation plots from the European Vegetation Archive (EVA) and other databases. Then we determined diagnostic, constant and dominant species for each habitat by calculating species-to-habitat fidelity and constancy (occurrence frequency) in the classified data set. Finally, we mapped the plot locations for each habitat. Results: Formal definitions were developed for 199 habitats at Level 3 of the EUNIS hierarchy, including 25 coastal, 18 wetland, 55 grassland, 43 shrubland, 46 forest and 12 man-made habitats. The expert system classified 1,125,121 vegetation plots to these habitat groups and 73,188 to other habitats, while 63,064 plots remained unclassified or were classified to more than one habitat. Data on each habitat were summarized in factsheets containing habitat description, distribution map, corresponding syntaxa and characteristic species combination. Conclusions: EUNIS habitats were characterized for the first time in terms of their species composition and distribution, based on a classification

of a European database of vegetation plots using the newly developed electronic expert system EUNIS-ESy. The data provided and the expert system have considerable potential for future use in European nature conservation planning, monitoring and assessment.

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Keywords

coastal habitat, diagnostic species, distribution map, dune vegetation, European Nature Information System (EUNIS), European Vegetation Archive (EVA), expert system, forest, grassland, habitat classification, man-made habitat, shrubland, vegetation database, vegetation plot, wetland

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