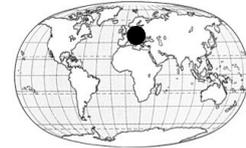


Martin KŘIVÁNEK, Petr PYŠEK, VOJTĚCH JAROŠIK

Institute of Botany, Academy of Sciences of the Czech Republic, Průhonice, Czech Republic



PREDICTING INVASIONS BY WOODY SPECIES: THE IMPORTANCE OF HISTORY, PROPAGULE PRESSURE AND SPECIES TRAITS

Woody species are frequent invaders with a high impact and often change ecosystem functions of invaded communities. Detailed information on their ecology, geography, and history of introduction makes them a convenient model group for testing the principles of plant invasions. The present paper is based on the DAWIS (Database of Alien Woody species with special regard to alien Invasive woody Species in the Czech Republic) data set, covering 1692 trees and shrubs planted in this country. A case study was conducted, using 28 species from the database that are used in forestry and for which there is a sufficiently detailed information on the date of introduction, date of escape from cultivation and extent of planting. The probability of escape from cultivation was affected by the year of introduction and number of planting areas, with the model explaining 39% of variance, misclassifying only three species, and both variables having a comparable significant effect. Model for the probability of naturalization provided less straightforward results and misclassified eight species. This indicates that predictive power of the year of introduction and planting variables decreases with proceeding naturalization, reflecting that once the species escapes from cultivation, propagule pressure from wild populations adds to that from planting. The database was further used to predict the impact of woody species and test it by using two previously developed risk assessment schemes: Australian Weed Risk Assessment Model (WRA) and North American Decision Tree, the latter developed specifically for woody species. The results of the application of these two models to Central European woody plants are reported. All 17 invasive species but only two of 31 occurring as casuals and one of 123 species not escaping from cultivation were rejected by WRA model. The reliability of Decision Tree Model was much lower. Results for naturalized species were less reliable and are discussed.

keywords: woody species, prediction, forestry