



Analysis of the spatio-temporal occurrence of five common Eurasian invasive species in different land cover (habitat) types

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Biological invasion is a known harmful environmental process that threatens native species and their natural habitats. The mass spread of invasive plants can result in an increased number of allergic diseases and potential flood risk. Spatial modelling and analysis of plant invasion can help mapping and predicting the spread of invasive plants. The aim was to investigate the spatio-temporal variability of five common Eurasian invasive plant species (tree of heaven, common milkweed, Russian olive, black locust, goldenrod) in the main land cover (habitat) type of National Ecosystem Service Mapping and Assessment (NÖSZTÉP) of Hungary, and how this has changed between 2009 and 2018. We calculated the percentage of EUROSTAT LUCAS field observation points infected with the species in the given year within the NÖSZTÉP main habitat type. Using these percentages of the LUCAS survey years (2009, 2012, 2015, 2018) we calculated trends of change of the occurrences of each invasive plants for each main land cover (habitat) type using linear, logarithmic, exponential, and binomial regression (R^2), and plotted the most significant changes on graphs. Graphs show considerable trends of change in the infection percentage of the main habitat types with a given species. If the R^2 value of the trend line for the study years was greater than or equal to 0.7, we defined as significant change in invasion within the main land cover (habitat) type. Direction of change within the studied period (2009-2018) could be increasing or decreasing. The results show that tree of heaven is spreading rapidly near roads and railways. Common milkweed is a major threat for diverse, mosaic, so-called complex landscapes, and grassland habitats. Black locust is becoming less common in built-up areas, presumably linked to the increasingly urban heat island environment. Goldenrod species prefer increasingly wetlands, posing a growing threat to floodplain habitats.