

## **DESCRIPTION FOR THE GENERAL PUBLIC**

Along with development of civilization and transformation of natural environments resulting from human activity, geographically alien species (e.g. originated from other continents) have begun to appear in areas where they have not previously occurred. Plant species transported by humans outside of their natural range, characterized by a wide tolerance of environmental conditions, rapid growth and adaptation to spread over long distances, started to colonize new areas and change native ecosystems. As a result of these invasions, native species have become less abundant and some of them have gone extinct. Therefore, invasive species are one of the most serious threats to biodiversity.

The impact of invasive alien species on biodiversity has become a considerable problem over the last decades, therefore, it has focused the attention of both scientists and entities managing natural areas trying to limit the invasions. Despite these efforts the number of invasive species and their range is ever increasing while drivers and consequences of invasions are poorly understood. One of the most interesting but unanswered questions concerns the importance of the landscape: whether in more heterogeneous landscapes (with high amount of different land cover types, fragmentation of habitats etc.) invasive alien species are more common than in more homogenous landscape? This problem has been especially poorly investigated in Central-Eastern Europe characterized by relatively high native biodiversity and large spatial variation in landscape heterogeneity.

Available results of the research on the effect of landscape heterogeneity on invasive plants that have been conducted so far are ambiguous. Part of the studies suggest that complex, heterogeneous landscapes are less prone to invasions due to high diversity of native species which efficiently utilize available resources (free space, water, nutrients) and thus limit invasions of alien plants in such landscapes. Moreover, habitat fragmentation (several small habitat patches instead of single large) hampers encroachment of new plants as available habitat patches are largely scattered and isolated. However, several other studies suggest that heterogeneous landscapes are more prone to invasions due to relatively high overall availability of suitable habitats. Moreover, in such landscapes the amount of spatial elements facilitating invasions (ecotones, borders between different land-use types, field verges, roads) and abundance of animal seed dispersers are usually higher. Therefore, the effect of landscape heterogeneity on occurrence of invasive species remains inconclusive.

The realization of the proposed research will enable verification of the abovementioned hypotheses and evaluation of the importance of landscape heterogeneity for the distribution of the selected invasive plant species in agricultural landscape of Poland. In order to meet this goal the inventory of the common invasive plant species will be conducted: goldenrods (*Solidago spp.*), hogweeds (*Heracleum spp.*) and box elder (*Acer negundo*) with the help of panoramic pictures available in Google Street View. Moreover, basing on the spatial databases (e.g. spatial configuration and share of different land-use types, spatial configuration of road network, Digital Elevation Model etc.), detailed information on landscape characteristics in the studied sites will be gathered. These data will allow for the selection of the most important landscape characteristics affecting the distribution of the studied invasive plant species.

Results of the project will deliver basic ecological knowledge, valuable for biological conservation. The planned research will allow for the better understanding of the invasion of alien plant species in a landscape and understanding of the role the landscape heterogeneity plays in this process. The expected results will also enable prediction of areas susceptible for invasion as well as sites being invasion hotspots. Thus, the results of the project will be helpful in designing measures aimed at preventing, hampering and cost-efficient eradicating invasive plants. Finally, using Google Street View causes that the project will provide novel, valuable and cheap methodology useful in tracking invasions of alien species.