
Species distribution 2.0: An accurate time- and cost-effective method of prospection using street view imagery

Laurent Hardion* , Agathe Leriche¹, Eugénie Schwoertzig , and Alexandre Millon

¹Institut Méditerranéen de Biodiversité et d'Ecologie marine et continentale (IMBE) – Aix-Marseille Université - AMU, CNRS : UMR7263, Institut de recherche pour le développement [IRD] : UMR237 – IMBE, Aix-Marseille Université, Campus Aix, Technopôle de l'Environnement Arbois-Méditerranée, Avenue Louis Philibert, Bâtiment Villemin, BP80, 13545 Aix-en-Provence cedex 04, France

Abstract

Species occurrence data provide crucial information for biodiversity studies in the current context of global environmental changes. Such studies often rely on a limited number of occurrence data collected in the field, and on pseudo-absences arbitrarily chosen within the study area. We propose an alternative method of prospection using geo-located street view imagery (SVI). Following a standardised protocol of virtual prospection using both vertical (aerial photographs) and horizontal (SVI) perceptions, we have surveyed 1097 randomly selected cells across Spain (0.1x0.1 degree, *i.e.* 20% of Spain) for the presence of *Arundo donax* L. (Poaceae). In total we have detected *A. donax* in 345 cells, substantially expanding beyond the now two-centuries-old field-derived record, which described *A. donax* only in 216 cells. Among these field occurrence cells, 81.1% were confirmed by SVI prospection to be consistent with species presence. In addition, SVI prospection recorded 752 cells where *A. donax* was considered absent. We have also compared the outcomes of climatic niche modeling based on SVI data against those based on field data. We have found SVI data to provide far more compelling results in terms of niche modeling than does field data. This original, cost- and time-effective method provides the means to accurately locate highly visible taxa and reinforce absence data without long and expensive *in situ* prospection. At this time, the majority of SVI data is restricted to human-disturbed environments. However, SVI is becoming increasingly available in natural areas, our alternative prospection method has considerable potential in future biodiversity studies.

Keywords: Occurrence data, presence, absence data, species distribution modelling, distribution gap, *Arundo donax*

*Speaker