Analiza pouzdanosti dostupnih prostornih podataka o invazivnim vrstama biljaka

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Uncertainty analysis of available spatial data on invasive plants

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This thesis was done on the Division of Botany, Department of Biology, Faculty of Science, University of Zagreb, under the mentorship of prof. dr. sc. Sven Jelaska. It is submitted to the Department of Biology, Faculty of Science, University of Zagreb to be evaluated to obtain the master's degree in ecology and nature preservation.

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Analiza pouzdanosti dostupnih prostornih podataka o invazivnim vrstama biljaka

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Korološki podatci o invazivnim vrstama (nalazi vrste) često se koriste u razvoju modela prostorne rasprostranjenosti vrsta sa ciljem utvrđivanja rasprostranjenosti invazivne vrste i razvoja mjera upravljanja. Prostorna preciznost koroloških podataka ovisi o metodi primjenjenoj prilikom kartiranja. Utvrđeno je da podatci manje prostorne preciznosti predstavljaju izvor nesigurnosti u razvoju modela te njihovo korištenje može uzrokovati netočne modele. U ovom istraživanju korišteni su korološki podatci iz četiri klase prostorne preciznosti za šest čestih invazivnih vrsta biljaka koji su preuzeti iz baze Flora Croatica Database. Korološki podatci su preklopljeni s kartama staništa te klimatskim, topografskim i demografskim podatcima s ciljem utvrđivanja utjecaja prostorne preciznosti na vezanost za stanište i okolišni profil vrste. Prostorna preklapanja obavljena su u GIS-u. Statistička analiza utjecaja prostorne preciznosti na okolišni profil uključivala je deskriptivnu statistiku, jednosmjernu ANOVA -u i Tukeyjev post-hoc test. Statistička analiza vezanosti za stanište uključivala je Friedmanovu ANOVA -u i Wilcoxonov test. Pokazalo se da niža prostorna preciznost podataka u pravilu utječe na dobivenu vezanost za staništa i okolišni profil vrste. Ipak, utjecaj prostorne preciznosti varirao je od vrste do vrste te od varijable do varijable. Stoga je uputno prije modeliranja testirati utjecaj prostorne preciznosti i temeljem rezultata odabrati povoljne podatke za razvoj modela.

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Uncertainty analysis of available spatial data on invasive plants

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Chorological data (species records) of invasive plant species are often used in developing species distribution models with goals of determining the distribution of species and implementing successful management measures. The spatial accuracy of records varies based on the methods used during the mapping process. It has been established that low spatial accuracy is a source of uncertainty in environmental modelling and can lead to faulty models. In this study spatial records of four different spatial precision levels were taken from Flora Croatica Database for six invasive plant species in Croatia. Habitats and environmental data were joined to species records and tested if spatial accuracy affects habitat preferences and ecological profile of species. Data were joined in QGIS and statistical analysis included descriptive statistics followed by one-way ANOVA with Tukey post-hoc test for testing the ecological profile and Friedman ANOVA followed by Wilcoxon Matched Pairs test for testing the habitat preference. The results show that lower spatial accuracy generally influences the habitat preferences and ecological profile. However, the effect of spatial precision greatly varies across species and variables and it should be tested before choosing the entry data for developing a species distribution model.

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1. INTRODUCTION

1.1.Invasive species

The term invasive species has not been clearly defined, with a lack of standardized terminology in the field (Colautti and MacIsaac, 2004; Davis, 2009, Essl et al. 2018). Nikolić et al. (2014) defined invasive species as species that humans have intentionally or non-intentionally introduced to a new area where they negatively affect biodiversity, human health or economy. Although the term is mostly used regarding introduced, non-native species, some native species can also become invasive (Brooks and Pyke, 2001, Carey et al. 2012). However, there is always an underlying human activity causing the invasiveness of the native species (Carey et al. 2012). Invasive species cause negative effects by serving as vectors for various pests, becoming weeds, reducing agricultural yields, changing the flora of an area, blocking waterways, affecting evolutionary paths etc. (Nikolić et al., 2014). Brennan and Withgott (2005) defined invasive species as one of the basic factors that threaten biodiversity.

Plants are the most extensively studied group in invasion biology, with 44% of all studied invasive species being plants (Pyšek et al., 2008). There are more than 6000 documented invasive alien plant species in the world. The most invasive plant families are *Compositae*, *Poaceae* and *Fabaceae* which account for about 30% of world's invasive plant species (Willis, 2017).

The flora of Croatia is rich in species – according to Flora Croatica Database (FCD) there are 4576 species and 5055 species and subspecies as of January 2021. In the FCD, 631 species are indicated as allochthonous out of which 77 species are invasive (Nikolić 2020a). Most invasive plant families are *Compositae* (35% of invasive species in Croatia belong to this family), *Poaceae* (11%) and *Solanaceae* (6%). As in other Mediterranean countries, the majority of invasive plant species in Croatia are of American origin (about 70%), whereas about a quarter (25%) are of Eurasian origin. The rest (about 6%) are of African and other origin (Nikolić et al. 2014).

The first records of invasive plant species in Croatia date from 19th century and were mostly recorded by famous Croatian botanist of that period, such as Schlosser, Visiani etc. The oldest known record to be found in FCD is that of *Sorghum halepense* on Dalmatian islands (Host 1802 in Nikolić et al. 2013). However, most of the invasive plant findings have happened from the middle of the 20th century onwards. The first national survey started in 2006 and marked the first systematical assessment of Croatian allochthonous and invasive flora (Nikolić et al. 2013). The survey resulted in the preliminary checklist of invasive alien plant species in Croatia consisting of 64 species (Boršić et al., 2008).

Since then, there was a lot of research on invasive plants in Croatia. Inventory of invasive species has been made for various areas, ex. Medvednica Nature Park (Vuković et al. 2010), the city of Sisak (Pruša et al. 2013), forests on Kalnik mountain (Horvat and Franjić 2016), woody species of the city of Karlovac (Ožura and Šag 2018) etc. Herbaria were checked for early invasive species records (Vilović et al. 2020). Taxa were studied individually, ex. *Reynoutria* spp. (Vuković et al. 2019), *Myriophyllum heterophyllum* (Vuković et al. 2018, Jasprica et al. 2017), *Egeria densa* (Rimac et al. 2018). Some research was focused on characteristics of invasive species that allow for invasiveness, such as allelopathic effect (Novak et al. 2018). Finally, distributional patterns of invasive species in Croatia were studied (Novak and Novak 2018, Nikolić et al. 2013).

In recent years a few projects dealing with invasive species were launched. Projects "Establishment of the National Monitoring System for Invasive Alien Species" (Croatian: "Uspostava nacionalnog sustava za praćenje invazivnih stranih vrsta") and "Development of a Management and Control System for Invasive Alien Species" (Croatian: "Razvijanje sustava upravljanja i kontrole invazivnih stranih vrsta") were launched in 2017 by Ministry of Economy and Sustainable Development.

The project "Establishment of the National Monitoring System for Invasive Alien Species" lasted from 2017 till the end of 2020. Activities on this project included collection of new data (mapping the invasive species), establishing an information system on alien and invasive species in Croatia and developing monitoring plans for some invasive alien species, in order to create a basis for the future management of these species.

The project "Development of a Management and Control System for Invasive Alien Species" started in 2017 and will finish in October 2021. As a part of this project, it is intended to develop two action plans concerning pathways of unintentional introduction of IAS, three species management plans for invasive animal species of Union concern, as well as to educate employees responsible for official controls (customs officers, policemen…) to recognize and take appropriate action during the transport of invasive species to Croatia. Both projects were co-financed by EU Cohesion Fund.

Furthermore, there was and still is a number of regional projects dealing with invasive plants in Croatia, such as "Sava TIES" (international project dealing with removal and control of invasive plant species in the Sava basin, conducted in Croatia, Slovenia, Bosnia and Herzegovina and Serbia), LIFE CONTRA *Ailanthus* (a project dealing with invasive tree *A. altissima* in Mediterranean region of Croatia) and many others.

1.2.Chorological data

Mapping is a process of adding spatial information to inventoried species, i.e. geocoding. Through mapping we obtain chorological data – data that contain information on distribution of the species. Chorological data are needed for numerous scientific studies in various fields (ex. biogeography, evolution, ecology etc.) and are also useful in many other economic activities such as forestry, agriculture or pharmacy. They are also vital for nature and biodiversity conservation (Nikolić, 2006).

Mapping can be done in an indirect (e.g. using various artificial grids) or a direct manner (by joining an exact coordinate to a species record).

The most commonly used cartographic grid systems in Croatia are MTB grid and UTM grid. Both MTB grid and UTM grid consist of basic grid units. Presence-absence data of a species are recorded for each basic grid unit. All basic grid units in which the species is recorded represent the distribution of that species (Nikolić et al., 1998; Nikolić, 2006).

MTB grid (German: Meßtischblätter – sheets of topographic map) was developed in Germany and is traditionally used for mapping of flora in Central Europe. It is defined by the geographic coordinate system (latitude and longitude). One degree rectangular is divided in 60 basic grid units with dimensions 10’ x 6’ (10’ of longitude and 6’ of latitude). One basic grid unit also corresponds to one sheet of topographic map with scale 1:25 000 and is named after that sheet. If needed, basic grid units of MTB grid can be divided in four smaller units (MTB 1/4), which can be further divided in four smaller units (MTB 1/16), which can, again, be divided in four smaller units (MTB 1/16) etc.. The advantage of using the MTB grid stems from it being defined by the latitude and longitude, i.e. from the fact that grid units are easily found on a map with meridians and parallels (Nikolić et al. 1998, Jelaska et al. 2003, Nikolić 2006).

UTM (Universal Transverse Mercator) is a map projection and grid system developed by the US Military in mid-20th century. The UTM grid spans between 84° N latitude and 80° S latitude. The Earth is divided in sixty zones in an east-west direction from 180th meridian east to Greenwich to the prime meridian. These zones span 6° in longitude and are numerated with numbers from 1 to 60. In north-south direction the Earth is divided in 20 bands that span 8° in latitude (except the north polar band which is 12° in latitude). These bands are lettered starting with C (the southern-most band) and ending with X (the north polar band). Additional bands covering Antarctic and Arctic regions are lettered with the remaining letters (A, B, Y, Z). The latitude bands are not a part of UTM grid but a part of the military grid reference system (MGRS) which is used in addition to UTM for the purpose of mapping. Each basic grid unit of the UTM grid is called a zone and marked with a number (1-60) and letter (C-X). Each zone can further be divided in basic grid units – squares with dimensions 100 km x 100 km which are marked by two letters. Basic grid units can be further divided in smaller units (Nikolić et al., 1998; Snyder 1987).

Joining an exact coordinate to a species record can be done using a map or a GPS device. GPS (Global Positioning System) uses microwave signals broadcast by satellites in Earth orbit. Satellites are located in Earth orbit in such fashion that a GPS device can receive signals from multiple satellites at all times. Using the time necessary for each of the signals to be received, GPS device calculates its distance from respective satellites and estimates its position on Earth through the triangulation process. Geocoding a species record using coordinates acquired by a GPS device is generally the most precise method. The location of the record can be determined with a precision of 5-50 m depending on atmospheric conditions and topography of the locality (Nikolić, 2006).

To be able to determine coordinates of a species record using a map, one must be acquainted with its features and know how to use it. Geocoding using a map is done by drawing the location on the map and subsequently reading the coordinates. The map with the drawn location must be included in the final report (Nikolić, 2006).

All the mentioned methods have their advantages as well as disadvantages. When mapping the coordinates directly (GPS, maps) the records have higher spatial precision. It is not complicated to acquire exact coordinates of a record because most of the maps feature the geographic grid and GPS devices are pretty affordable nowadays, with the majority of smartphones containing GPS receiver as well. Moreover, records of higher spatial resolution can be converted to lower spatial resolution whereas the reverse is not possible. These methods are preferred when mapping the flora of a smaller area or the distribution of a rare species (Nikolić et al. 1998). However, directly mapping each species record is very time consuming so it makes no sense to apply this method when mapping bigger areas or distributions of common and widely spread species. Additionally, field and atmospheric conditions can influence the performance of the GPS receiver and consequently the positional accuracy of obtained data (Nikolić, 2006).

The advantage of indirect mapping methods is great – field work is simple, and it is easy to add new species to already established floristic lists. Mapping using grids is also suitable for widely spread species because they are recorded just once per basic grid unit. Data acquired through mapping by grids can easily be statistically analysed. Data of required spatial resolution is obtained by choosing the size of basic grid unit used. However, data acquired by indirect mapping is always of smaller spatial precision than that obtained by direct mapping. Furthermore, using a grid with too big basic grid units can lead to data of insufficient spatial precision. Indirect mapping is also unsuitable for mapping of rare species (Nikolić, 2006).

1.3. Distribution of invasive plant species and species distribution models

Invasive plant species are not evenly distributed. Since they are mostly spread through human activities, they are found in bigger abundancy near human settlements and traffic corridors (such as roads, railways, rivers etc.) (Štajerová et al. 2017). Past research in Croatia has shown the same distributional pattern. Nikolić et al. (2013) found that the greatest number of invasive plant species (>30 per grid cell) was found in big urban areas of Zagreb and Split. Following with up to 20 invasive plant per grid cell are smaller urban centers such as Osijek, Rijeka, Makarska and Dubrovnik. Up to 10 invasive plant species per grid cell were found in valleys of major rivers, such as the Sava, the Drava, the Danube, the Krka and the Cetina. Furthermore, the number of invasive plant species showed positive correlation with the population of human settlements. These areas rich in invasive plant species were relatively small compared to the territory of the Republic of Croatia and confined to urban areas. In general, most of the grid cells contained a small number of invasive plant species with the average being 4.7 per grid cell which points to relatively low invasive plant species diversity in Croatia. Dimension of the grid cell used in the study was approximately 35 km^2.

The knowledge on distribution of invasive plants is very important in terms of management and conservation strategies.

Species distribution is fundamentally tied to their habitat. Species distribution models (SDMs) are an important tool in biogeography and ecology. By combining species occurrence data and environmental variables SDMs identify the environmental space in which a species has been recorded. Based on that SDMs can be used to predict the suitability of a site for a species, i.e. potential distribution of a species. Usually, geographic information system (GIS) is used as a tool when developing SDMs (Araújo and Guisan 2006, Moudrý and Šímová 2012).

Since GIS is just a simplified representation of the world, there are various sources of uncertainty in SDMs, arising from both the dependant and the explanatory variables and the algorithm or functions used to relate those variables (Moudrý and Šímová 2012).

Dependant variable are species occurrence data, i.e. spatial data. Sources of uncertainty with spatial data can be sample size (Wisz et al. 2008, Gábor et al. 2019a), positional accuracy (Graham et al. 2008, Gábor et al. 2019b) and availability of true-absence data (Václavík and Meentemeyer 2009, Moudrý and Šímová 2012).

Positional accuracy, i.e. positional error has been recognised as the greatest contributing factor to the reduced accuracy of the SDMs in some studies (Johnson and Gillingham 2008, Orešković 2017). When data have positional error, it appears that species are present on habitats and in environmental conditions in which they do not appear in nature. This leads to overestimation of species habitat area, especially at finer resolution (Guisan et al. 2007, Feeley and Silman 2010, Moudrý and Šímová 2012). Therefore, when developing SDMs, it is necessary to consider the influence of spatial accuracy on results of distribution modelling and to use data of sufficient spatial accuracy and an appropriate spatial resolution.

1.4. Aims of the study

The aim of this study was to determine to what extent does the spatial precision of chorological data and the map scale of cartographic layers influence the certainty of information on preferences of an invasive species for a habitat and on the ecological profile of the species.

2. MATERIALS AND METHODS

2.1. Flora Croatica Database (FCD) – chorological data

Flora Croatica Database (FCD) is the national database of vascular flora of the Republic of Croatia. It was first developed in the 1990-ies and has since been further upgraded through various initiatives and projects (Nikolić et al. 2001, Nikolić 2020b, Nikolić 2020c). Among other data, it contains geocoded chorological data obtained from literature, herbaria, field records and oral communication. Based on mapping methods or source reliability, FCD distinguishes 12 spatial precision levels (IDs) of chorological data ranging from 0 to 11 (Table 1.). The lowest precision level is level 0 (ID 0). The data with ID 0 are not actually geocoded – they are presence-only data showing whether a species is present in the Republic of Croatia. The highest precision level is level 11 (ID 11) corresponding to data mapped with a GPS device (Nikolić 2020b).

Table 1. Description of spatial precision levels of chorological data in FCD.

PRECISION LEVEL	DESCRIPTION
ID 0	Presence-only data for the territory of the Republic of Croatia
ID 1	Low spatial precision, regions (ex. Dalmatia, Norther Croatia)
ID 2	MTB1 grid, UTM 10 x 10 km grid; precision of ca. 100 km^2
ID 3	MTB.1/4 grid, precision of cca 25 km^2
ID 4	Mostly MTB1/16 grid, precision of ca. 10 km^2
ID 5	Populated places, precision mostly ca. 5 km^2
ID 6	Toponyms with small area (ex. islets), precision of ca. 1 km^2
ID 7	Map scale 1:100 000, precision of ca. 100 – 200 m
ID 8	Map scale 1: 50 000, precision of ca. 50 – 100 m
ID 9	Map scale 1: 25 000, precision of ca. 25 – 50 m
ID 10	Map scale 1: 5 000, precision of ca. 5 – 10 m
ID 11	GPS device, precision of ± 5 – 50 m

For this research, I used chorological data of six invasive plant species: *Ailanthus altissima* (Hill.) Swingle, *Ambrosia artemisiifolia* L., *Echinocystis lobata* (Michx.) Torr. et A. Gray, *Erigeron anuus* (L.) Desf., *Robinia pseudoacacia* L. and *Veronica persica* Poir. with precision levels ID 5, ID 6, ID 7 and ID 11. I acquired the data from FCD. I chose the six species based on the number of available data and so to include both woody and herbaceous species.

The number of available data per species per ID is shown in the Appendix 1.

The data used per species varied between 189 and 10389. The species with the highest number of available data was *R. pseudoacacia* with 10389 data. The species with the least data was *E. lobata* with 189 available data. The largest data set among all six species was available for ID 11, ranging from 94 to 10054, whereby *R. pseudoacacia* had the most and *E. lobata* the least data. For three species (*A. artemisiifolia*, *E. lobata* and *V. persica*) the precision level with least available data was ID 6 (ranging from 22 to 139). In the case of *A. altissima*, *E. annuus* and *R. pseudoacacia* ID 5 had the least available data (ranging from 54 to 149).

2.2. Habitat maps

Habitat map of the Republic of Croatia, "**HM04**", (map scale 1: 100 000, minimum mapping unit: 9 ha) is a spatial representation of habitats released in 2004 by the State Institute for Nature Protection. In 2016, the map of terrestrial non-forest habitats of Republic of Croatia was released, "**HM16**", (map scale 1: 25 000, minimum mapping unit 1,56 ha). Both maps are available as GIS layers at the website of Ministry of Environmental Protection and Energy and were used in this study. Habitats are categorized according to the National Habitats Classification of Croatia (Croatian: Nacionalna klasifikacija staništa, NKS) (Official Gazzete NN 88/2014).

Corine Land Cover (CLC, Coordination of Information on the Environment) is a digital inventory of European Union which was launched in 1985 with the aim of harmonizing land cover and land use data among European countries. It consists of 44 classes of land cover and uses Minimum Mapping Unit of 25 ha (reference year 1990) and was updated four times – in 2000, 2006, 2012 and 2018. For this research, CLC 2012 of Croatia was used as it was the most recent available version at the time of conducting this analyses.

Not all chorological data could be used for the habitat analysis since there were geometric errors in some data when adding the values of habitats maps. The number of data used per analysis involving each of habitat maps could be seen in Appendix 2.

2.3. Environmental Data

Environmental data used for this study can be divided in three groups: topography, climate, and proxies for human disturbance (demographics and roads).

Topographical variables that were used in this study were: elevation, slope, northness, eastness (which are cosine and sine of aspect respectively) and the distance from watercourses. The spatial resolution of all the grid topographical layers was 300 m x 300 m. I calculated the distance from watercourses in three spatial resolutions: 100 m x 100 m, 1 km x 1 km and 5 km x 5km.

I selected four temperature variables (two annual and two quarterly) and three precipitation variables (one annual and two quarterly) and downloaded the corresponding GIS layers from the WorldClim (Table 2.). The spatial resolution of climatic layers was resampled to 300 m x 300 m (www.worldclim.org).

Table 2. Climatic variables used in this study.

BIO 1	Annual Mean Temperature
BIO 7	Temperature Annual Range
BIO 10	Mean Temperature of the Warmest Quarter
BIO 11	Mean Temperature of the Coldest Quarter
BIO 12	Annual Precipitation
BIO 17	Precipitation of Driest Quarter
BIO 18	Precipitation of Warmest Quarter

I calculated the distance from roads and generated three grids with spatial resolutions 100 m x 100 m, 1 km x 1 km and 5 km x 5 km.

I generated a population density grid by interpolation of point data representing centroids of settlements in Croatia. I downloaded the population data of Croatian settlements (i.e. number of inhabitants) from the GeoSTAT^{RH} web portal, developed by the Croatian Bureau of Statistics (geostat.dzs.hr).

2.4. Data Analysis

2.4.1. Spatial Analysis

I used the chorological data taken from FCD in QGIS (version 3. 10. 12 'A Coruña') as vector point layers (points representing each record of species). For each species, I separated the data in five vector layers based on their ID, for example: *Ailanthus*5 (chorological data of *A. altissima* with ID 5), *Ailanthus*6 (chorological data of *A. altissima* with ID 6), *Ailanthus*7 (chorological data of *A. altissima* with ID 7), *Ailanthus*11 (chorological data of *A. altissima* with ID 11), *Ailanthus*_all (chorological data of *A. altissima* with IDs 5, 6, 7 and 11) (Figure 1. & Figure 2.).

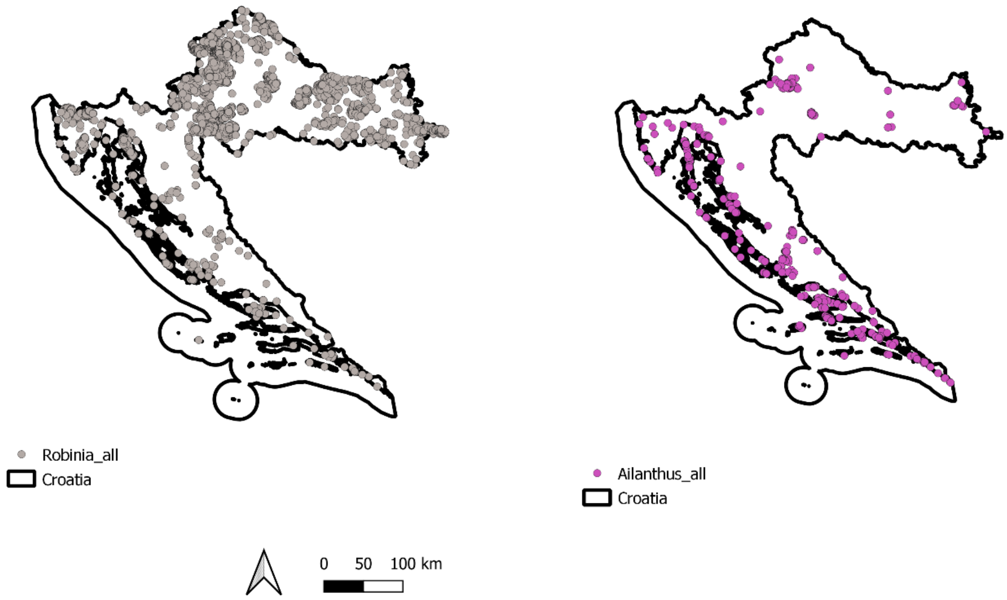

Figure 1. Distributional patterns of invasive woody species *R. pseudoacacia* and *A. altissima*. Points show species records with ID precisions 5, 6, 7 and 11.

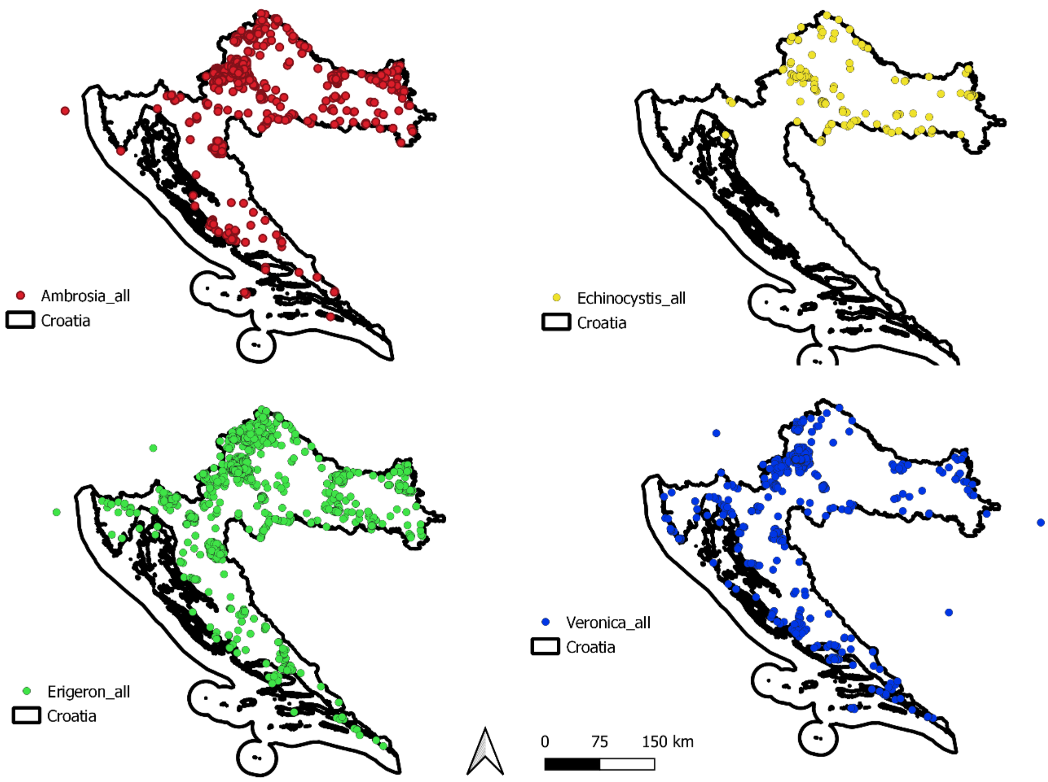

Figure 2. Spatial distributions of invasive herbaceous species *A. artemisiifolia*, *E. lobata*, *E. annuus* and *V. persica*. Points show records with ID precisions 5, 6, 7 and 11.

I added the environmental data and habitat types to the points (records of species) using the tools "Join attributes by location" (Figure 3.) and "Add raster values to points" (Figure 4.).
The tool "Join attributes by location" adds values of features from one vector layer to features of another vector layer. I used it to join the values of CLC, habitats map of Croatia, terrestrial non-forest habitats map of Croatia and climatic variables (which were in form of a vector layer) to chorological data.

Figure 1. Application of the tool "Join attributes by location" in QGIS.

The tool "Add raster values to points" adds values from a raster layer to points of a vector layer. I used it to add values of topographic variables, distance from watercourses, distance from roads and population density (which were in form of a raster layer) to chorological data.

After adding the values of all the variables to chorological data, I subjected the data to a vector analysis tool "Statistics by Categories" and categorized them by different categories of habitats (Figure 3.).

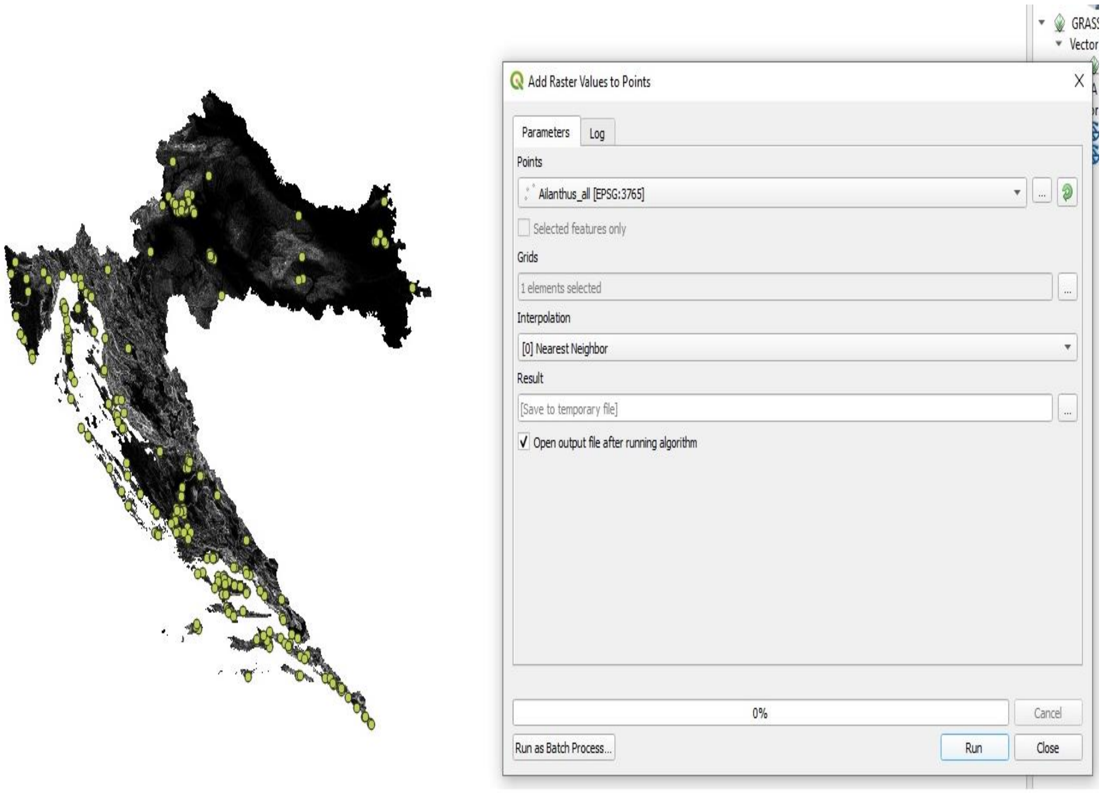

Figure 2. Application of the tool "Add raster values to points" in QGIS.

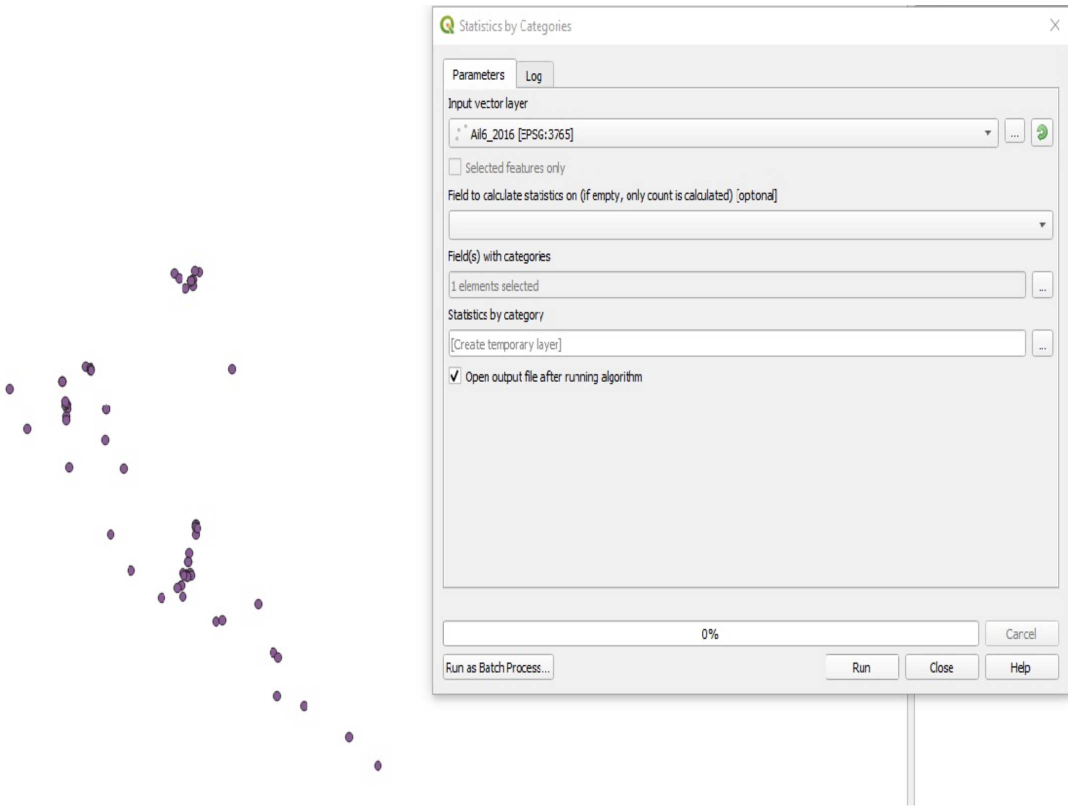

Figure 3. Application of the "Statistics by Categories" tool in QGIS.

2.4.2. Statistical Analysis

I used TIBCO Statistica® 13.3.0 software package for the statistical analysis. I calculated the descriptive statistics of environmental variables and used one-way ANOVA with Tukey's post-hoc test to test if there are any statistical differences between the datasets of the environmental variables of different spatial precision.

I have analysed the habitat categorical data in Statistica and calculated the non-parametric statistics. At first, I calculated the Friedman ANOVA of frequencies and then, if p value was ≤ 0.05, I used the Wilcoxon Matched Pairs test.

3. RESULTS

3.1. Habitat analysis

Statistics by categories showed that species records were found on 28 different habitat types on the CLC layer (as shown in Appendix 3.). *R. pseudoacacia* was found on the biggest number of different habitats, being recorded on 26 various habitats. *E. lobata* was recorded on 15 habitats only. *A. altissima* was recorded on 22 habitats, *V. persica* on 23 habitats and *A. artemisifolia* and *E. annuus* on 25 habitats respectively.

In all six species, the dataset that was recorded on most habitats was ID 11. The dataset recorded on least habitats was ID 5 (*E. lobata*, *E. annuus*, *R. pseudoacacia*) or ID 7 (*A. altissima*, *A. artemisiifolia*, *V. persica*).

At the significance level of 0.05 Friedman ANOVA test (results in Appendix 6.) showed that there are significant differences between datasets of different spatial accuracy in *A. artemisiifolia* and *E. annuus*. In other species there was no significant differences. Wilcoxon Matched Pairs test that followed showed that there are significant differences between datasets of ID 5 with ID 11and "all" in both *A. artemisiifolia* and *E. annuus* (tables in Appendix 7.).

When analysing the HM04 and HM16, it was observed that the species were found on 71 and 55 different habitat types, respectively (tables in Appendices 4. and 5.). On HM04, *E. annuus* was recorded on the biggest number of habitats – 59 different habitats, followed by *R. pseudoacacia* which was recorded on 58 habitats. *E. lobata* was again found on the smallest number of habitats – 26. *A. altissima* was reocrded on 38 habitats, *A. artemisiifolia* on 48 habitats and *V. persica* on 49 habitats. On HM16 *E. annuus* was also recorded on the highest number of habitats (46) and *E. lobata* on the least (17). *A. altissima* was recorded on 24 habitats, A. *artemisiifolia* on 37 habitats, *R. pseudoacacia* on 35 habitats and *V. persica* on 29 habitats.

On both maps, the biggest number of habitats in each of the species was recorded for dataset ID 11. On HM04, the smallest number was recorded for dataset ID 5, except in *E. lobata* where it was the case with ID 6. On HM16, the smallest number was also generally recorded for ID 5 (ID 5 and ID 6 in *E. lobata*) with the exception of *V. persica* where it was the case with ID 7.

At the significance level of 0.05 Friedman ANOVA test showed that there are significant differences between datasets of different spatial accuracy in *A. artemisiifolia, E. annuus, R. pseudoacacia* and *V. persica* for both habitat maps (results in Appendix 6.).

Results of Wilcoxon Matches Pairs test per species and habitat maps are represented in the Appendix 7.

In *A. artemisiifolia*, significant differences were found for all three habitat maps. It was observed that the pair ID 5 and “all” was significantly different in both HM04 and HM16. It was also, as previously mentioned, significantly different in CLC. ID 5 and ID 11 were significantly different in HM16 and in CLC. In general, ID 5 differed significantly from all other ID in HM16. In HM04, ID 7 differed from ID 11 and “all”.

In *E. annuus*, there were also significant differences observed in all three habitat maps and there were two pairs of datasets which differed one from another on both maps – ID 5 and ID 11 as well as between ID 5 and “all”. ID 5 also differed from ID 6 in both HM04 and HM16.

In *R. pseudoacacia*, ID 5 and all & ID 11 and “all” differ significantly on both HM04 and HM16. More significantly different pairs were observed for HM16 than for HM04.

In *V. persica*, there were also more differences observed for HM16 than for HM04. There were three pairs that differed significantly on both maps – ID 5 and “all”, ID 7 and ID 11 & ID 7 and “all”.

3.2. Environmental analysis

Descriptive statistics which were calculated for environmental data can be found in Appendix 8.

At the confidence level of 0.95 one-way ANOVA (Table 3.) showed that there were statistically significant differences in environmental variables in all six species.

Table 3. Results of one-way ANOVA showing if there are any significant differences between datasets of different spatial precision in six studied invasive species.

Species	Effect	Multivariate Tests of Significance Sigma-restricted parameterization Effective hypothesis decomposition					
		Test	Value	F	Effect	Error	p
Ailanthus altissima	Intercept	Wilks	0.000232	197676.3	18	824.000	0.00
	IDPREC	Wilks	0.749373	3.4	72	3242.541	0.00
Ambrosia artemisiifolia	Intercept	Wilks	0.000188	456478.6	20	1720.000	0.00
	IDPREC	Wilks	0.534543	14.6	80	6787.607	0.00
Echinocystis lobata	Intercept	Wilks	0.000069	265777.9	18	332.000	0.00
	IDPREC	Wilks	0.502416	3.5	72	1307.868	0.00
Erigeron annuus	Intercept	Wilks	0.000221	703308.7	18	2800.00	0.00
	IDPREC	Wilks	0.830603	7.4	72	11012.69	0.00
Robinia pseudoacacia	Intercept	Wilks	0.003856	280670.9	18	19556.00	0.00
	IDPREC	Wilks	0.855865	43.1	72	76901.68	0.00
Veronica persica	Intercept	Wilks	0.000191	445087.6	17	1449.000	0.00
	IDPREC	Wilks	0.783099	5.4	68	5688.605	0.00

The results of Tukey post-hoc test are shown in Appendix 9.

Climatic variables were observed to be most inconsistent of environmental variables. Generally, there were more significant differences in annual than in quarterly climatic variables. The most inconsistent climatic variable was BIO7 (Temperature Annual Range). In *A. altissima* and *E. annuus* ID 7 differed most significantly for BIO7 (Figure 4., Figure 7.), whereas in E. lobata it was ID 6 (Figure 6.). In the other three species, there were two datasets that differed most significantly: ID 6 & ID 7 in *A. artemisiifolia* (Figure 5.), ID 5 & ID 6 in *R. pseudoacacia* (Figure 8.) and ID 5 & ID 7 in *V. persica* (Figure 9.).

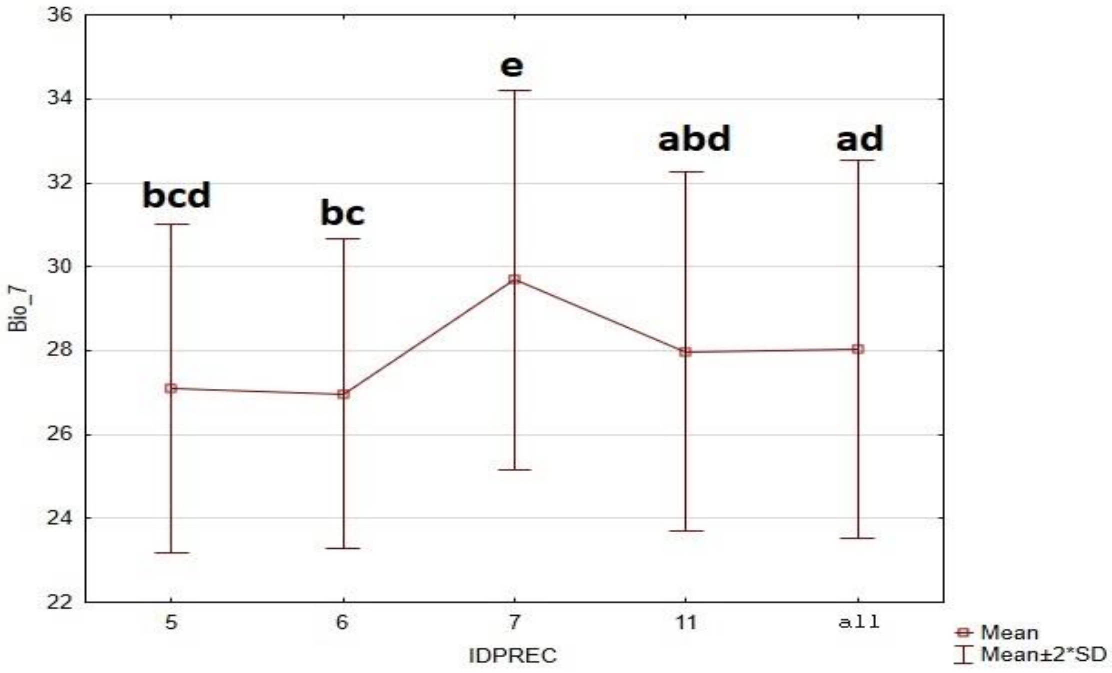

Figure 4. Box and whiskers plot showing mean values of Annual Temperature Range (BIO7) with double standard deviation for five *A. altissima* datasets of different spatial accuracy.

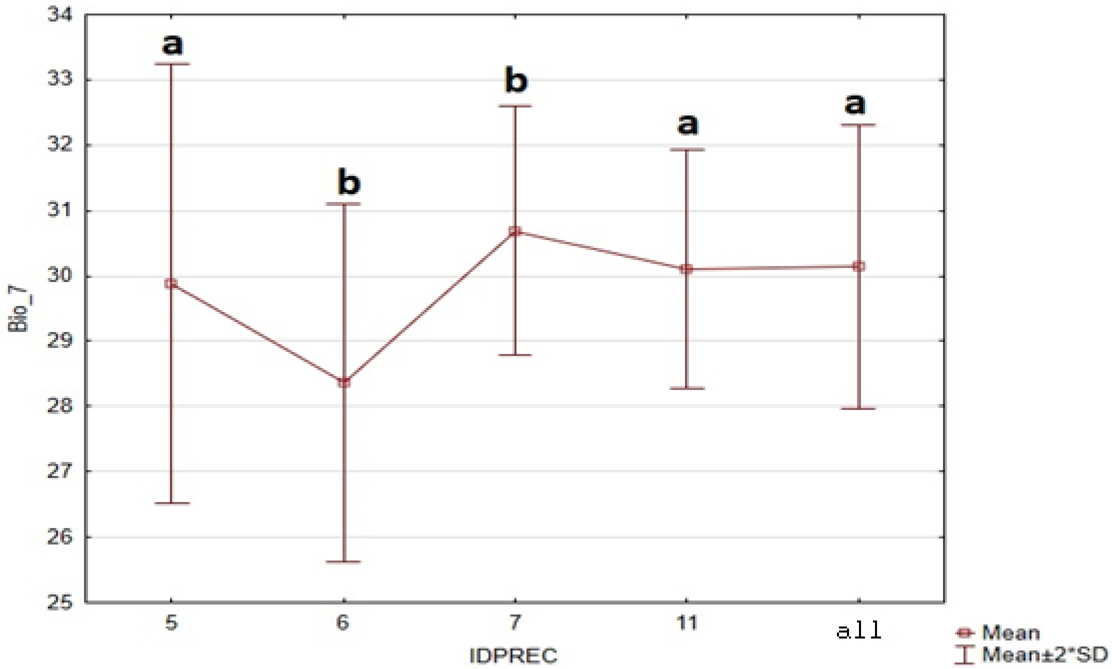

Figure 5. Box and whiskers plot showing mean values of Annual Temperature Range (BIO7) with double standard deviation for five *A. artemisiifolia* datasets of different spatial accuracy.

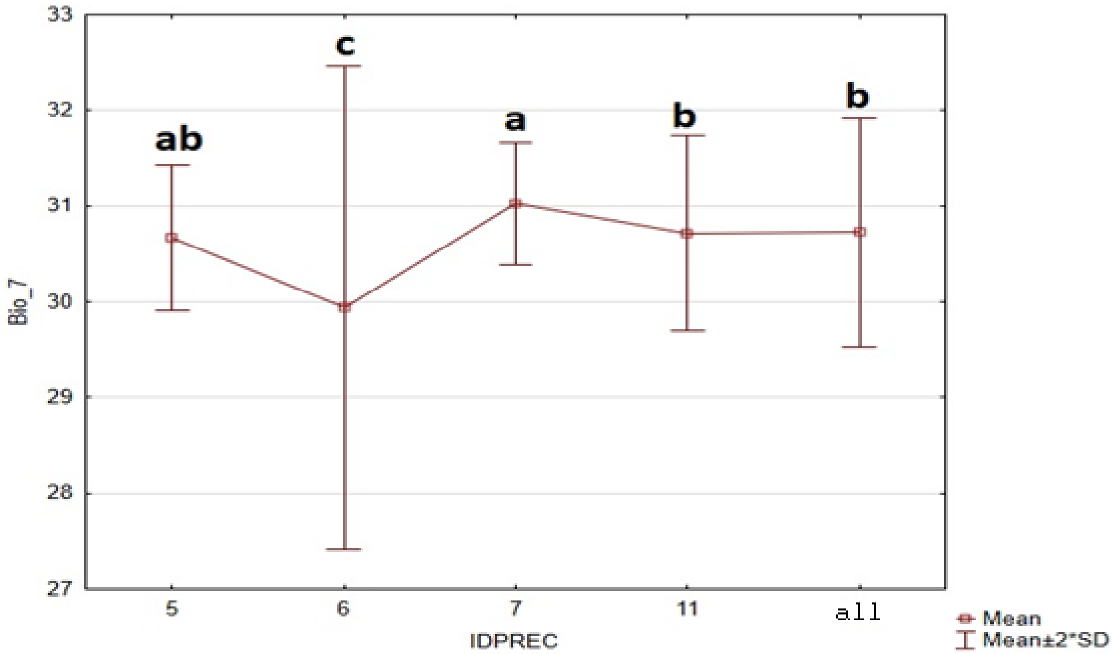

Figure 6. Box and whiskers plot showing mean values of Annual Temperature Range (BIO7) with double standard deviation for five *E. lobata* datasets of different spatial accuracy.

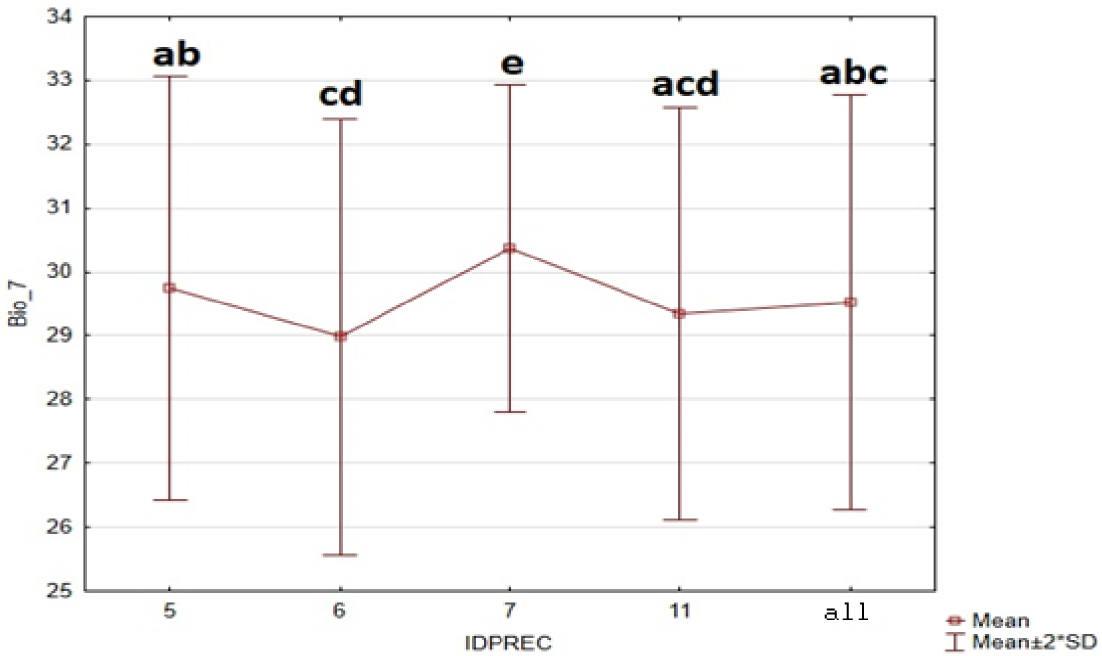

Figure 7. Box and whiskers plot showing mean values of Annual Temperature Range (BIO7) with double standard deviation for five *E. annuus* datasets of different spatial accuracy.

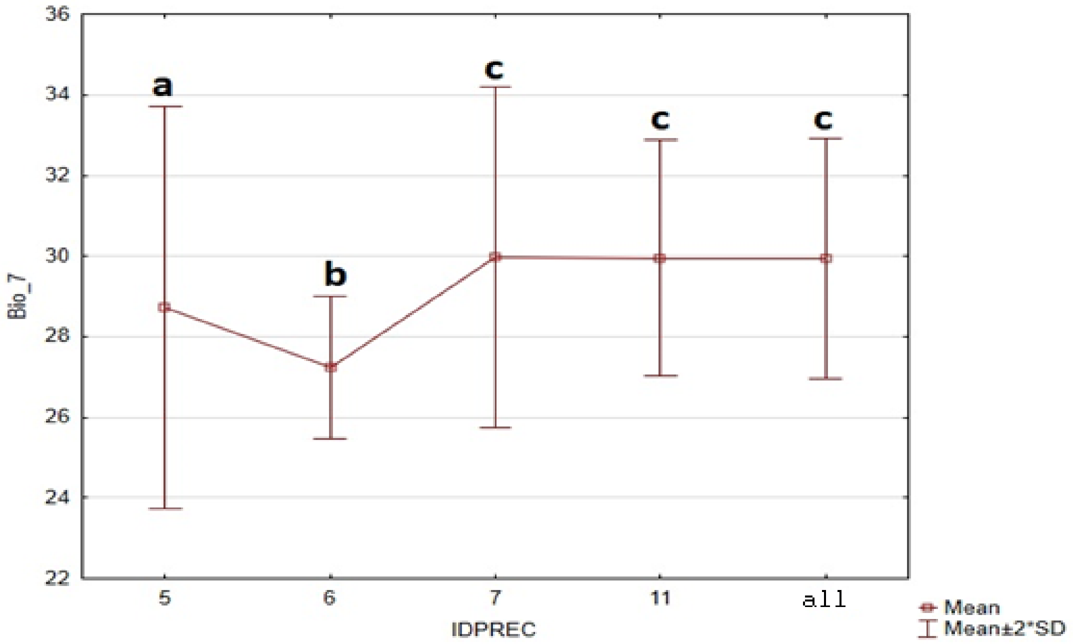

Figure 8. Box and whiskers plot showing mean values of Annual Temperature Range (BIO7) with double standard deviation for five *R. pseudoacacia* datasets of different spatial accuracy.

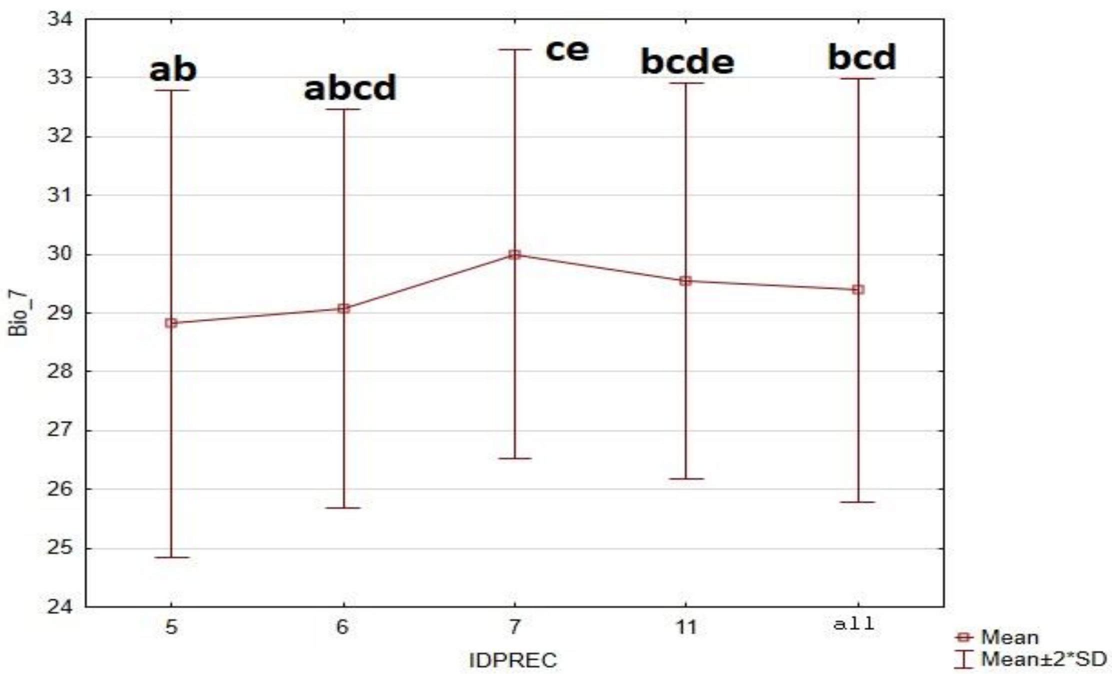

Figure 9. Box and whiskers plot showing mean values of Annual Temperature Range (BIO7) with double standard deviation for five *V. persica* datasets of different spatial accuracy.

In *A. altissima*, ID 7 differed most significantly from other spatial precisions for four climatic variables (BIO1, BIO7, BIO10, BIO18) and ID 6 differed most significantly for the other two.

In *E. lobata* ID 6 differed most significantly for four climatic variables (BIO7, BIO11, BIO12, BIO17) and ID 5 differed most significantly for BIO1 and BIO10. There were no significant differences in BIO 18.

In *R. pseudoacacia*, most significant differences were generally observed for ID 5, ID 6 and ID 7, except for BIO18 where there were no statistically significant differences among variables

In *E. annuus* the least consistent IDs were ID 5 for BIO1, BIO11 and BIO18 and ID 6 for BIO 12, BIO 17 and BIO 18. For BIO 7, the least consistent ID was ID 7.

In *V. persica*, the least consistent ID regarding climatic variables was ID 5 with most significant differences in BIO1, BIO7, BIO10, BIO11 and BIO18. ID 6 was least consistent in BIO10, BIO12 and BIO17 and ID 7 in BIO 7 and BIO 17.

Regarding topographic variables, northness and eastness were generally consistent among all six species. Inconsistencies were observed for slope, elevation and distance from watercourses. The most inconsistent topographic variable was elevation. In three species (*A. altissima, A. artemisiifolia, V. persica*) it was a result of a difference between one dataset and the other four (Figures 10.-12.). The most differences were observed in *E. annuus* (Figure 13.).

Regarding disturbance, a lot of significant differences were observed in *E. annuus* and *R. pseudoacacia* for both the distance from roads at all three spatial resolutions and population density. There were no differences observed for *A. altissima* for either of these variables. In *E. lobata* and *V. persica*, population density was observed to show significant differences along with some differences in the distance from roads. *A. artemisiifolia* showed no significant differences for population density. However, there were some differences in the distance from roads at the finer spatial resolution.

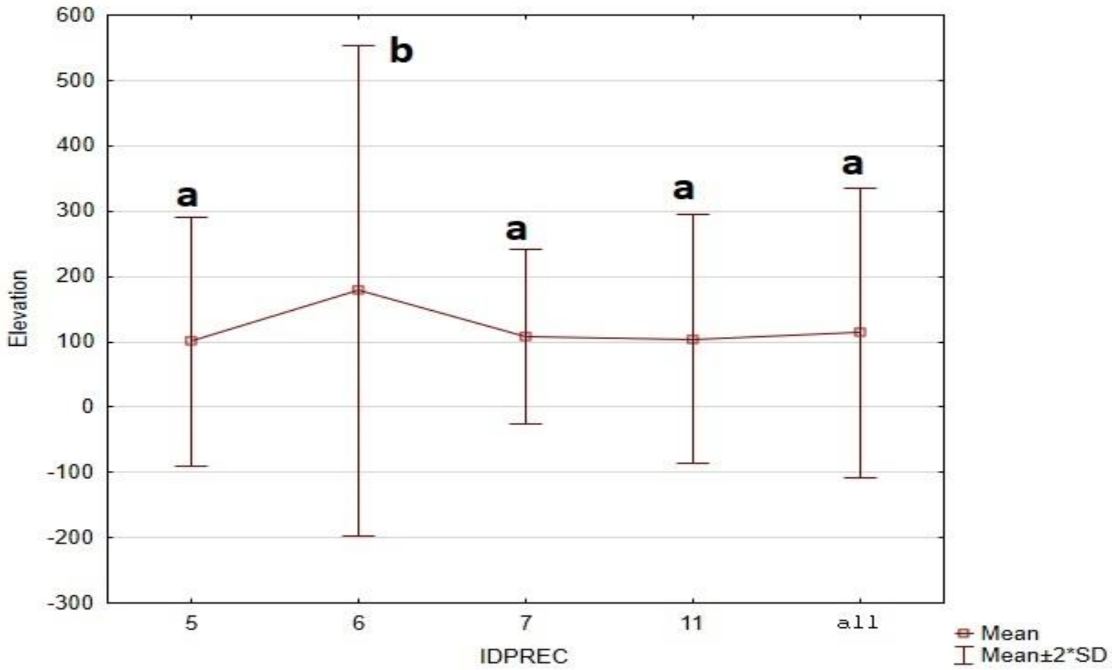

Figure 10. Box and whiskers plot showing mean elevation with double standard deviation for five *A. altissima* datasets of different spatial accuracy.

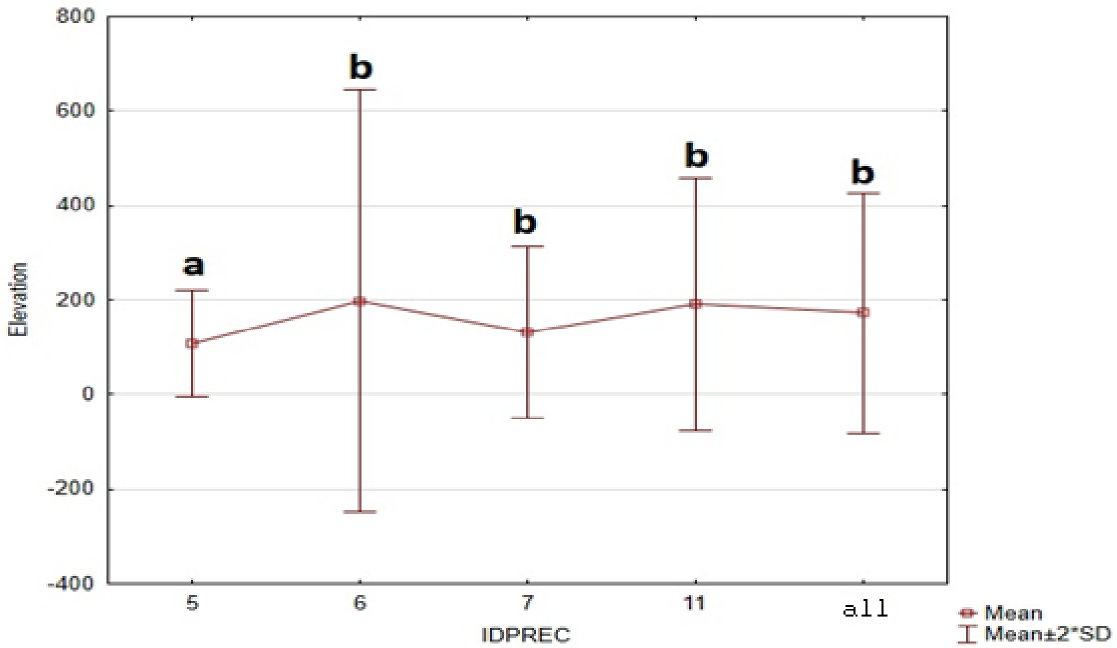

Figure 11. Box and whiskers plot showing mean elevation with double standard deviation for five *A. artemisiifolia* datasets of different spatial accuracy.

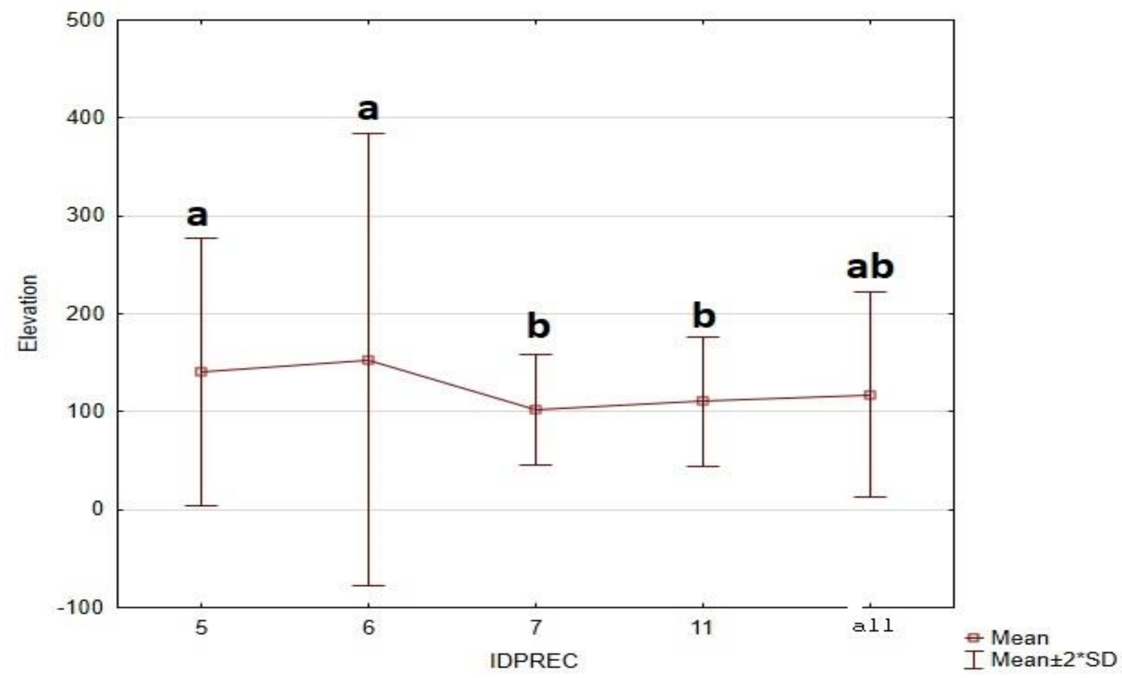

Figure 12. Box and whiskers plot showing mean elevation with double standard deviation for five *E. lobata* datasets of different spatial accuracy.

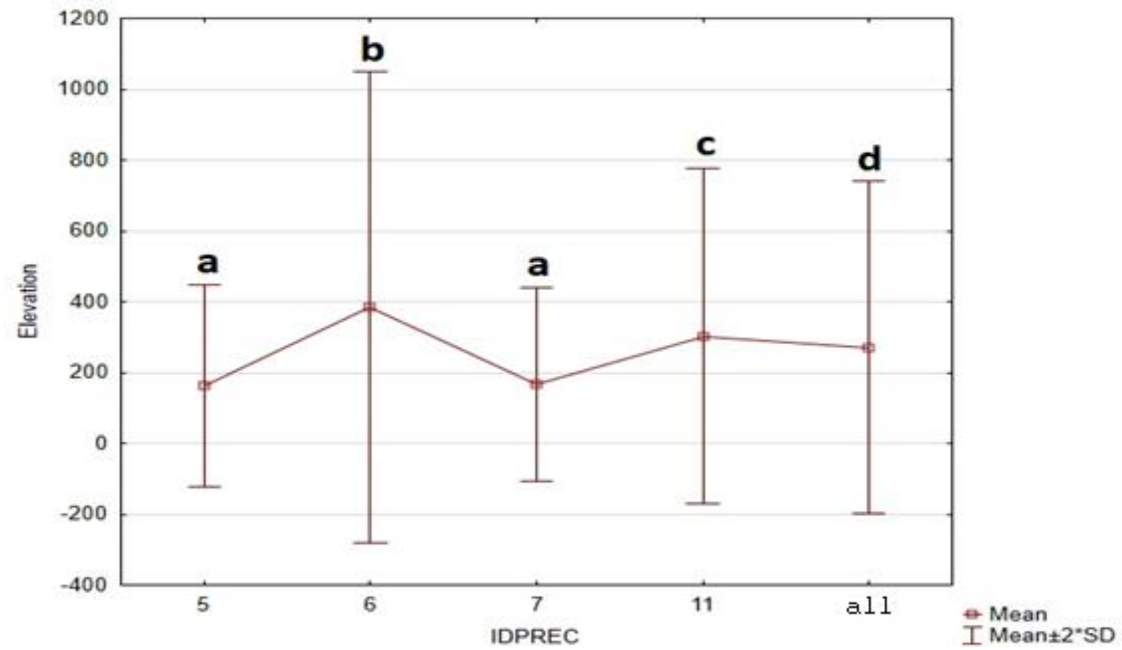

Figure 13. Box and whiskers plot showing mean elevation with double standard deviation for five *E. annuus* datasets of different spatial accuracy.

4. DISCUSSION

4.1. Habitat preference

When analysing the frequencies of different habitats in different species per dataset, it was observed that there is usually a lot more habitat types in datasets ID 11 than in datasets with lower spatial precision, especially ID 5. It was also observed that the roughly the same habitat types prevail in the datasets with higher spatial precision in comparison to those that are less frequent in dataset ID 5. On the other hand, habitats that are frequent in ID 5 are usually less frequent in datasets ID11 and "all". Habitat comoposition of datasets ID 6 and ID 7 varied in similarity with the other datasets from species to species.

In terms of the analysis of habitat preferences, some species showed no significant differences whatsoever, some showed significant differences only for habitat maps of Croatia and some showed significant differences for both habitat maps and CLC.

A. altissima and *E. lobata* showed no significant differences for any map which suggests that spatial precision does not affect the calculated preference of these species for habitats. Both of this species have a specific distribution – *A. altissima* is usually found near human settlements or alongside roads, whereas *E. lobata* is found in river valleys (Nikolić et al. 2014, Novak and Novak 2018).

In other four species, significant differences were usually found between ID 5 and the other four datasets, often ID 11 or "all" (especially if differences were found across all three maps). Since ID 5 is of the lowest spatial accuracy, it can happen that the joined value of the habitat does not correspond to the real habitat on which the species was recorded. Therefore, it is expected for the data set ID 5 to be significantly different than other IDs of higher spatial accuracy where the joined value has a much higher chance of corresponding to the real habitat (especially for ID 11 where the spatial precision is ± 5 – 50 m) (Guisan et al. 2007, Moudrý and Šímová 2012, Orešković 2017). However, there were also some other datasets that differed, ex. ID 7 and ID 11 & ID 7 and "all" in *V. persica*, although they are of both higher spatial accuracy and bigger sample size than ID 5 and ID 6.

R. pseudoacacia and *V. persica* showed inconsistencies between datasets of different spatial precision for habitat maps of Croatia only. This can be explained by the size of the minimum mapping unit of CLC compared to the one of habitat maps of Croatia. Namely, CLC has a bigger minimum mapping unit which means the resolution of the map is lower and so is the habitat diversity (it does not differentiate between finer categories of habitats) (Saura 2002, Manzoor et al. 2018). Therefore, it is less likely for a false value to be joined to a species record, although the joined habitat type will usually be more general than in finer scale maps.

4.2. Environmental profile

Although the results of the analysis of distance from watercourses and factors of human disturbance (distance from roads, population density) are in line with the expectations based on the knowledge of ecology and distribution of *A. altissima* in Croatia (Nikolić et al. 2014, Novak and Novak 2018), inconsistencies were observed for some topographic variables and climatic variables. In case of slope and elevation, the differences are a result of one dataset standing out. Among climate variables there is a lot of inconsistencies. ID 7 was the most different dataset for 5 climate variables, whereas ID 6 for the other two (BIO 12, BIO 17).

In case of *E. lobata*, which has a prevailing specific distribution in river valleys (Nikolić et al. 2014), there are significant differences in environmental variables that in most cases arise from one dataset being different from all others. It is usually the dataset ID 6. Although it is not the least accurate dataset, it is the dataset of the smallest sample size (only 13 records) which probably influenced the results of analysis (Wisz et al. 2008). In case of BIO1, BIO 10, and the distance from roads (finer spatial accuracies) the most different dataset is ID 5, probably because of its lowest spatial accuracy (Feeley and Silman 2010, Moudrý and Šímová 2012).

Inconsistencies in environmental variables in *A. artemisiifolia* were primarily observed for climate variables but also for elevation, distance from watercourses and distance from roads in finer spatial resolutions. The only significant difference in elevation is between the data set ID 5 (least spatial accuracy) and other data sets, whereas there are no significant differences in slope. It can be explained by the distribution of *A. artemisiifolia* in Croatia which is primarily spread on the anthropogenic habitats (human settlements, alongside roads, agricultural land…) in the continental part of the country which is more of a lowland area (Nikolić et al. 2014). The inconsistencies in distance from watercourses arise between ID 5 and other IDs. Again, since ID 5 is of the lowest spatial accuracy, the values joined to the species records do not correspond to the real situation in nature (Feeley and Silman 2010, Moudrý and Šímová 2012). The same seems to be the case with the distance from roads with the spatial resolution of 1 km x 1 km. However, for distance from roads at the finest spatial resolution (100 m x 100 m) the data set which stands out is the data set ID 7.

There are inconsistencies among all climate variables and there is no particular dataset that stands out as the most different. There are cases in which the most spatially precise dataset is the most different (BIO1, BIO 10, BIO 18), as well as where the dataset with lowest spatial resolution is the most different (BIO12, BIO17). In either case joined values did not correspond to the ones in nature for the datasets of insufficient spatial accuracy (ID 5 for BIO1, BIO 10 and BIO 18 or ID 5, ID 6 and ID 7 for BIO 11, BIO 12 and BIO 17). The exception was BIO 7 where the most different were ID 6 and ID 7.

In both *E. annuus* and *R. pseudoacacia*, there was a lot of inconsistencies observed with various datasets being most inconsistent for various variables. Both species are known to be eurivalent for a broad range of factors, tolerating different temperatures and various soils (Nikolić et al. 2014, Nicolescu et al. 2020). *E. annuus* should prefer humid habitats and soil moisture whereas *R. pseudoacacia* is drought resistant (Pacanoski 2017, Nicolescu et al. 2020). There was a lot of differences observed for both species in distance from watercourses.

Since ID 5 was in the most cases the most inconsistent dataset among climatic variables of *V. persica*, often as the only dataset different from all others, the inconsistencies likely arise from the low spatial accuracy of this dataset. For topographic variables and disturbance, the most inconsistent dataset was ID 6. There were no differences observed for distance from watercourses which can be explained by the ecology of the species. *V. persica* is a very widespread species that is not affected by soil moisture (Nikolić et al. 2014).

To summarize, ID 5 was generally the most inconsistent dataset in the analysis (especially for habitat maps) which can be explained by low spatial resolution. However, there are inconsistencies in other datasets of higher spatial resolution that cannot be explained through spatial accuracy or sample size. The most inconsistent dataset varies a lot across species and variables. In species with specialised ecological requirements (e.g. *E. lobata*), there was less inconsistencies and they could usually be explained when taking in account the positional accuracy and sample size. In species with a broader ecological preferecnes and distribution (e.g. *R. pseudoacacia* and *E. annuus)* there were a lot more inconsistencies.

5. CONCLUSION

Following conclusions can be drawn from this master thesis:

- The effects of spatial accuracy of species records on the habitat preference and ecological profile are species dependant.

- There is generally less uncertainty dependant on the spatial accuracy in more specialised species (in terms of distribution) than in species with broader distribution.

- Before using datasets of different spatial accuracies, their consistency should be tested in order to select the data of sufficient spatial accuracy for developing a SDM.

- In general, using the records of spatial precision level ID 5 should be avoided when developing SDMs if there is sufficient amount of data of higher spatial accuracy. However, records with ID 5 are still valuable in obtaining information on the general distribution of the species.

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APPENDICES

Appendix 1. Number of data used per species per ID.

Appendix 2. Number of data used per species per ID in habitats analyses.

Appendix 3. Frequencies of different habitat types according to the CLC code in six studied invasive species.

Appendix 4. Frequencies of different habitat types according to the Croatian National Habitat Classification (NKS) and Habitat map of Croatia (2004) in six studied invasive species.

Appendix 5. Frequencies of different habitat types according to the Croatian National Habitat Classification and the map of terrestrial non-forest habitats (2016) in six studied invasive species.

Appendix 6. Results of Friedman ANOVA.

Appendix 7. Results of the Wilcoxon Matched Pairs test.

Appendix 8. Results of descriptive statistics of environmental variables.

Appendix 9. Results of Tukey post-hoc test.

Appendix 1. Number of data used per species per ID.

Species	ID	Number of data
Ailanthus altissima (Hill.) Swingle	5	54
Ailanthus altissima (Hill.) Swingle	6	70
Ailanthus altissima (Hill.) Swingle	7	72
Ailanthus altissima (Hill.) Swingle	11	310
Ailanthus altissima (Hill.) Swingle	all	506
Ambrosia artemisiifolia L.	5	128
Ambrosia artemisiifolia L.	6	110
Ambrosia artemisiifolia L.	7	154
Ambrosia artemisiifolia L.	11	749
Ambrosia artemisiifolia L.	all	1141
Echinocystis lobata (Michx.) Torr. et A. Gray	5	33
Echinocystis lobata (Michx.) Torr. et A. Gray	6	22
Echinocystis lobata (Michx.) Torr. et A. Gray	7	40
Echinocystis lobata (Michx.) Torr. et A. Gray	11	94
Echinocystis lobata (Michx.) Torr. et A. Gray	all	189
Erigeron annuus (L.) Desf.	5	149
Erigeron annuus (L.) Desf.	6	279
Erigeron annuus (L.) Desf.	7	243
Erigeron annuus (L.) Desf.	11	1122
Erigeron annuus (L.) Desf.	all	1793
Robinia pseudoacacia L.	5	58
Robinia pseudoacacia L.	6	164
Robinia pseudoacacia L.	7	113
Robinia pseudoacacia L.	11	10054
Robinia pseudoacacia L.	all	10389
Veronica persica Poir.	5	161
Veronica persica Poir.	6	139
Veronica persica Poir.	7	177
Veronica persica Poir.	11	350
Veronica persica Poir.	all	827

Appendix 2. Number of data used per species per ID in habitats analyses.

Species	ID	Number of data		
		CLC	Habitats 2004	Habitats 2016
Ailanthus altissima (Hill.) Swingle	5	54	52	53
Ailanthus altissima (Hill.) Swingle	6	69	67	68
Ailanthus altissima (Hill.) Swingle	7	72	71	71
Ailanthus altissima (Hill.) Swingle	11	310	300	303
Ailanthus altissima (Hill.) Swingle	all	505	490	495
Ambrosia artemisiifolia L.	5	128	128	128
Ambrosia artemisiifolia L.	6	109	109	109
Ambrosia artemisiifolia L.	7	154	154	154
Ambrosia artemisiifolia L.	11	748	744	748
Ambrosia artemisiifolia L.	all	1139	1135	1139
Echinocystis lobata (Michx.) Torr. et A. Gray	5	33	33	33
Echinocystis lobata (Michx.) Torr. et A. Gray	6	21	21	21
Echinocystis lobata (Michx.) Torr. et A. Gray	7	40	40	40
Echinocystis lobata (Michx.) Torr. et A. Gray	11	93	91	92
Echinocystis lobata (Michx.) Torr. et A. Gray	all	187	185	186
Erigeron annuus (L.) Desf.	5	147	147	146
Erigeron annuus (L.) Desf.	6	274	274	273
Erigeron annuus (L.) Desf.	7	243	242	243
Erigeron annuus (L.) Desf.	11	1118	1116	1118
Erigeron annuus (L.) Desf.	all	1782	1179	1780
Robinia pseudoacacia L.	5	58	58	58
Robinia pseudoacacia L.	6	162	161	160
Robinia pseudoacacia L.	7	113	112	113
Robinia pseudoacacia L.	11	10053	10049	10049
Robinia pseudoacacia L.	all	10386	10380	10380
Veronica persica Poir.	5	161	159	160
Veronica persica Poir.	6	139	137	137
Veronica persica Poir.	7	177	176	176
Veronica persica Poir.	11	346	339	345
Veronica persica Poir.	all	823	811	818

Appendix 3. Frequencies of different habitat types according to the CLC code in six studied invasive species.

CLC code	***A. altissima***					***A. artemisiifolia***					***E. lobata***				
	ID5	**ID6**	**ID7**	**ID11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**
111	5.56	7.25	15.28	1.29	1.19	2.34	0.92	3.90	0.27	1.05	0.00	0.00	0.00	0.00	0.00
112	50.00	10.14	40.28	19.35	11.49	64.84	14.68	31.82	19.92	26.08	42.42	9.52	12.50	3.23	12.83
121	1.85	0.00	9.72	1.61	8.32	1.56	0.92	6.49	4.28	3.95	0.00	0.00	5.00	0.00	1.07
122	0.00	0.00	0.00	1.29	5.94	1.56	0.00	0.00	0.13	0.26	0.00	4.76	0.00	0.00	0.53
123	1.85	0.00	0.00	0.00	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00
132	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
141	0.00	2.90	0.00	6.77	9.11	1.56	0.00	0.00	2.27	1.67	0.00	0.00	0.00	0.00	0.00
142	3.70	1.45	0.00	0.65	3.37	0.00	1.83	0.00	1.34	1.05	0.00	0.00	0.00	3.23	2.14
211	0.00	0.00	0.00	0.00	0.00	2.34	0.92	7.79	4.41	4.30	6.06	0.00	2.50	1.08	2.14
212	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.13	0.35	0.00	0.00	0.00	0.00	0.00
221	0.00	0.00	1.39	0.65	0.59	0.00	0.00	0.00	0.53	0.35	0.00	0.00	0.00	0.00	0.00
222	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
223	1.85	4.35	0.00	0.65	2.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
231	0.00	1.45	0.00	2.26	3.37	0.78	7.34	13.64	6.15	6.67	0.00	4.76	17.50	15.05	11.76
242	9.26	2.90	5.56	6.13	0.99	17.97	15.60	15.58	28.88	24.58	30.30	19.05	25.00	8.60	17.11
243	12.96	18.84	11.11	5.81	1.58	3.91	10.09	5.84	8.69	7.90	9.09	19.05	15.00	0.00	6.95
311	1.85	18.84	5.56	7.74	1.78	1.56	29.36	5.19	9.76	10.10	3.03	14.29	5.00	21.51	13.90
312	0.00	7.25	1.39	10.32	1.19	0.00	0.92	0.00	0.13	0.18	0.00	0.00	0.00	0.00	0.00
313	1.85	0.00	2.78	1.94	24.36	0.00	4.59	0.00	0.80	0.97	3.03	4.76	0.00	0.00	1.07
321	0.00	4.35	0.00	4.52	7.52	0.00	0.92	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
323	5.56	2.90	2.78	2.26	2.57	0.78	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00

324	1.85	11.59	1.39	15.48	0.59	0.00	7.34	4.55	3.21	3.42	6.06	0.00	0.00	12.90	7.49
333	1.85	1.45	0.00	0.32	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
411	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.26	0.00	0.00	0.00	3.23	1.60
511	0.00	0.00	2.78	4.84	4.55	0.78	2.75	3.25	1.34	1.67	0.00	4.76	15.00	11.83	9.63
512	0.00	1.45	0.00	1.61	0.79	0.00	0.92	0.00	6.68	4.48	0.00	14.29	2.50	18.28	11.23
523	0.00	2.90	0.00	4.52	0.20	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	1.08	0.53

CLC code				***E.annuus***				***R. pseudoacacia***				***V. persica***			
	ID 5	ID 6	ID 7	ID 11	all	ID 5	ID 6	ID 7	ID 11	all	ID 5	ID 6	ID 7	ID 11	all
111	3.40	1.82	5.76	1.25	2.13	8.62	0.00	1.77	0.01	0.08	8.70	4.32	15.25	0.29	5.83
112	55.10	10.95	35.39	6.26	14.98	58.62	8.64	33.63	0.86	1.66	47.20	17.99	52.54	22.83	33.17
121	0.68	0.73	4.53	0.98	1.40	1.72	0.00	7.08	0.07	0.15	0.62	1.44	4.52	0.00	1.34
122	2.72	0.00	0.00	0.36	0.45	0.00	0.00	0.00	0.06	0.06	2.48	0.00	0.00	0.00	0.49
123	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
131	0.00	0.00	0.00	0.36	0.22	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
132	0.00	0.36	0.00	0.00	0.06	0.00	0.62	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
141	0.68	1.46	0.41	4.83	3.37	0.00	1.23	0.00	0.41	0.41	1.24	0.72	0.00	4.62	2.31
142	0.00	1.09	0.00	1.16	0.90	1.72	0.62	1.77	0.05	0.09	0.62	1.44	0.00	4.62	2.31
211	0.68	0.73	4.12	3.49	2.92	3.45	0.62	1.77	1.55	1.55	1.86	0.00	1.69	2.31	1.70
212	0.00	0.00	0.41	0.27	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
221	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.09	0.10	0.62	0.00	1.13	0.87	0.73
222	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.12
223	0.00	0.36	0.00	0.00	0.06	0.00	1.23	0.88	0.02	0.05	0.00	0.00	0.00	0.00	0.00
231	2.04	3.28	10.29	8.77	7.58	1.72	3.70	0.00	1.18	1.21	0.62	5.76	2.82	3.47	3.16
242	18.37	8.76	13.58	19.77	17.12	12.07	8.02	14.16	6.07	6.22	15.53	10.79	9.04	26.88	18.10
243	8.84	10.95	7.82	14.40	12.51	8.62	16.67	9.73	13.56	13.54	11.18	12.95	4.52	10.40	9.72
311	6.80	31.02	10.29	19.32	18.86	1.72	41.36	14.16	57.47	56.43	2.48	22.30	3.39	9.25	8.87
312	0.00	3.28	0.41	1.43	1.46	0.00	0.62	0.00	0.07	0.08	0.62	1.44	0.00	0.87	0.73

313	0.00	15.33	0.82	3.40	4.60	0.00	3.70	1.77	2.00	2.01	0.00	3.60	1.13	1.16	1.34
321	0.00	1.09	0.00	0.09	0.22	0.00	1.85	0.00	0.10	0.13	0.00	0.72	0.00	0.29	0.24
323	0.00	0.00	0.41	0.00	0.06	1.72	0.00	0.88	0.00	0.02	1.86	2.16	0.56	0.00	0.85
324	0.68	6.93	3.29	6.80	5.84	0.00	6.79	7.08	16.11	15.78	2.48	11.51	1.13	4.34	4.50
333	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.01	0.04	0.00	0.00	0.00	0.29	0.12
411	0.00	0.36	0.00	0.63	0.45	0.00	0.00	0.00	0.10	0.10	1.24	0.00	0.00	1.16	0.73
511	0.00	1.09	2.06	1.61	1.46	0.00	1.23	3.54	0.05	0.11	0.00	0.00	2.26	1.16	0.97
512	0.00	0.36	0.00	4.74	3.03	0.00	0.00	0.00	0.13	0.13	0.00	2.16	0.00	3.18	1.70
523	0.00	0.00	0.41	0.00	0.06	0.00	1.23	0.88	0.01	0.04	0.00	0.72	0.00	2.02	0.97

*CLC nomenclature

CLC code	**Name**
111	Continuous urban fabric
112	Discontinuous urban fabric
121	Industrial or commercial units
122	Road and rail networks and associated land
123	Port areas
131	Mineral extraction sites
132	Dump sites
141	Green urban areas
142	Sport and leisure facilities
211	Non-irrigated arable land
212	Permanently irrigated land
221	Vineyards
222	Fruit trees and berry plantations
223	Olive groves

231	Pastures
242	Complex cultivation pattern
243	Land principally occupied by agriculture, with significant areas of natural vegetation
311	Broad-leaved forest
312	Coniferous Forests
313	Mixed forest
321	Natural grasslands
323	Sclerophyllous vegetation
324	Transitional woodland-shrub
333	Sparsely vegetated areas
411	Inland marshes
511	Water courses
512	Water bodies
523	Sea and ocean

Appendix 4. Frequencies of different habitat types according to the Croatian National Habitat Classification (NKS) and Habitat map of Croatia (2004) in six studied invasive species.

	A. altissima					A. artemisiifolia					E. lobata				
NKS code	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**
A.1.1.	0.00	0.00	0.00	1.00	0.61	0.00	0.00	0.00	3.76	2.47	0.00	14.29	0.00	9.89	6.49
A.2.7./A.2.2./A.1.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	5.49	2.70
A.1.3./A.4.1./J.4.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
A.2.3.	0.00	0.00	0.00	0.00	0.00	0.00	1.83	4.55	1.34	1.76	0.00	0.00	10.00	13.19	8.65
A.2.7.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00
A.4.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
B.1.4./B.2.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	0.27	0.62	3.03	4.76	7.50	8.79	7.03
C.2.3./C.2.2./E.3.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	1.30	0.13	0.35	0.00	0.00	5.00	4.40	3.24
C.2.3.	0.00	0.00	1.41	0.33	0.41	0.78	0.92	0.00	0.81	0.62	0.00	0.00	0.00	1.10	0.54
C.3.3./C.2.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.2.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	9.74	0.13	1.50	0.00	4.76	7.50	0.00	2.16
C.3.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.54	0.44	0.00	0.00	0.00	0.00	0.00
C.3.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.3.5.	0.00	7.46	0.00	7.33	5.51	0.00	1.83	0.00	1.08	0.88	0.00	0.00	0.00	0.00	0.00
C.3.5./D.3.1.	1.92	7.46	0.00	10.00	7.35	0.00	0.92	1.30	0.27	0.44	0.00	0.00	0.00	0.00	0.00
D.3.1./C.3.5.	1.92	0.00	0.00	1.67	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.3.4./C.3.5.	0.00	2.99	0.00	0.67	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.3.5./D.3.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.3.5./E.3.5.	0.00	1.49	0.00	0.33	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.3.5./C.3.5.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

I.2.1./C.3.5.	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.3.6.	3.85	2.99	2.82	0.00	1.22	0.78	1.83	0.65	0.40	0.62	0.00	0.00	0.00	0.00	0.00
C.3.6./D.3.4.	0.00	1.49	1.41	2.33	1.84	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.4.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.1.1./E.1.1.	0.00	0.00	2.82	0.67	0.82	0.00	0.00	2.60	0.40	0.62	0.00	14.29	5.00	2.20	3.78
D.1.2.	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
D.3.4.	3.85	4.48	2.82	2.33	2.86	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
I.2.1./D.3.4.	0.00	0.00	0.00	0.33	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.1.1./E.1.2.	0.00	0.00	0.00	0.33	0.20	0.00	0.92	0.00	1.08	0.79	3.03	0.00	0.00	5.49	3.24
E.2.1.	0.00	0.00	0.00	0.67	0.41	0.00	2.75	0.00	0.27	0.44	0.00	0.00	0.00	3.30	1.62
E.2.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.67	0.53	0.00	0.00	0.00	1.10	0.54
E.3.1.	0.00	2.99	0.00	0.33	0.61	0.00	14.68	0.65	2.82	3.35	0.00	0.00	0.00	4.40	2.16
E.3.2.	0.00	0.00	1.41	0.33	0.41	0.00	0.92	0.65	1.08	0.88	0.00	0.00	2.50	2.20	1.62
E.3.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.26	0.00	0.00	0.00	0.00	0.00
E.3.5.	0.00	16.42	0.00	3.33	4.29	0.00	0.00	0.00	0.40	0.26	0.00	0.00	0.00	0.00	0.00
E.7.4./E.3.5.	0.00	4.48	0.00	16.00	10.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.4.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.4.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.4.5.	0.00	0.00	0.00	0.00	0.00	0.00	17.43	2.60	5.11	5.37	3.03	19.05	0.00	6.59	5.95
E.4.6.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.5.1.	0.00	0.00	0.00	0.00	0.00	0.00	3.67	0.00	0.00	0.35	3.03	0.00	0.00	0.00	0.54
E.5.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.65	0.94	0.79	0.00	0.00	0.00	0.00	0.00
E.6.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.7.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.7.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.7.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.8.1.	0.00	4.48	2.82	2.00	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.8.2.	0.00	5.97	5.63	5.33	4.90	0.00	0.92	0.00	0.13	0.18	0.00	0.00	0.00	0.00	0.00
E.9.2.	0.00	1.49	0.00	0.67	0.61	0.78	0.00	0.00	0.27	0.26	0.00	0.00	0.00	0.00	0.00

E.9.3.	0.00	1.49	2.82	0.00	0.61	0.00	0.00	1.30	1.61	1.23	0.00	0.00	5.00	1.10	1.62
G.3.1.	0.00	1.49	0.00	2.33	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I.2.1.	3.85	0.00	8.45	3.67	3.88	2.34	10.09	14.94	19.35	15.95	9.09	9.52	25.00	10.99	13.51
I.2.1./J.1.1./I.8.1.	15.38	8.96	1.41	1.67	4.08	3.91	2.75	0.65	1.88	2.03	9.09	0.00	0.00	1.10	2.16
I.3.1.	3.85	2.99	1.41	0.67	1.43	4.69	8.26	5.84	14.38	11.54	9.09	14.29	12.50	5.49	8.65
I.5.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00
I.5.1./I.5.2.	1.92	1.49	0.00	0.33	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I.5.2.	0.00	0.00	0.00	0.33	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I.5.3.	1.92	0.00	1.41	1.00	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I.8.1.	1.92	0.00	5.63	7.00	5.31	0.00	7.34	6.49	7.66	6.61	0.00	0.00	0.00	2.20	1.08
J.1.1.	28.85	2.99	0.00	2.00	4.69	40.63	4.59	2.60	6.18	9.43	36.36	0.00	0.00	1.10	7.03
J.1.1./J.1.3.	11.54	1.49	0.00	4.67	4.29	10.94	0.00	0.00	0.67	1.67	6.06	0.00	2.50	1.10	2.16
J.1.3.	3.85	0.00	2.82	0.33	1.02	3.13	0.00	0.00	0.13	0.44	12.12	0.00	0.00	0.00	2.16
J.2.1.	13.46	13.43	39.44	14.67	17.96	12.50	3.67	25.97	9.01	11.19	6.06	0.00	5.00	5.49	3.78
J.2.2.	0.00	0.00	12.68	4.67	4.69	15.63	5.50	10.39	13.84	12.78	0.00	19.05	7.50	3.30	6.49
J.2.3.	0.00	1.49	0.00	0.33	0.41	1.56	0.00	0.65	0.67	0.70	0.00	0.00	0.00	0.00	0.00
J.4.1.	1.92	0.00	2.82	0.00	0.61	2.34	0.00	1.30	0.40	0.70	0.00	0.00	5.00	0.00	1.08
J.4.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
J.4.3.	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.65	0.40	0.53	0.00	0.00	0.00	0.00	0.00
J.4.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J.5.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00

NKS code	*E. annuus*					*R. pseudoacacia*					*V. persica*				
	ID 5	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**
A.1.1.	0.68	1.09	0.00	2.60	1.85	0.00	0.62	0.00	0.08	0.09	0.00	2.19	0.00	1.77	1.11
A.2.7./A.2.2./A.1.1.	0.00	0.00	0.00	0.72	0.45	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
A.1.3./A.4.1./J.4.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A.2.3.	0.00	1.09	2.89	0.99	1.18	0.00	0.62	3.57	0.07	0.12	0.00	0.00	2.27	0.88	0.86
A.2.7.	0.00	0.00	0.00	0.27	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.25
A.4.1.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.12
B.1.4./B.2.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
C.2.2.	0.00	1.09	1.65	0.99	1.01	0.00	0.00	0.00	0.28	0.27	0.00	0.00	0.57	0.88	0.49
C.2.3./C.2.2./E.3.1.	0.00	0.36	0.83	0.27	0.34	0.00	0.00	1.79	0.07	0.09	0.00	0.00	1.14	0.29	0.37
C.2.3.	0.00	0.36	3.72	1.43	1.46	0.00	0.00	0.89	2.11	2.05	0.00	0.00	0.00	1.18	0.49
C.3.3./C.2.3.	0.00	0.00	0.00	0.36	0.22	0.00	0.00	0.00	0.02	0.02	0.63	0.00	0.00	0.00	0.12
C.2.4.	0.00	0.36	6.20	0.09	0.96	0.00	0.62	0.00	0.01	0.02	0.00	0.00	0.57	0.29	0.25
C.3.3.	1.36	0.73	0.41	1.61	1.29	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.57	0.59	0.37
C.3.4.	0.00	0.00	0.00	0.27	0.17	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00
C.3.5.	0.00	0.36	0.00	0.72	0.51	0.00	1.24	0.00	0.03	0.05	0.00	2.92	0.57	1.47	1.23
C.3.5./D.3.1.	0.00	0.73	0.83	1.25	1.01	1.72	2.48	0.00	0.32	0.36	2.52	2.92	0.57	0.88	1.48
D.3.1./C.3.5.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.3.4./C.3.5.	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.89	0.04	0.07	0.63	0.73	0.00	0.00	0.25
C.3.5./D.3.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
C.3.5./E.3.5.	0.00	0.36	0.00	0.00	0.06	0.00	1.24	0.00	0.24	0.25	0.00	2.19	0.00	1.18	0.86
E.3.5./C.3.5.	0.00	0.36	0.83	0.18	0.28	0.00	0.62	0.00	0.08	0.09	0.00	0.00	0.00	0.00	0.00
I.2.1./C.3.5.	0.00	0.00	0.00	0.18	0.11	0.00	0.62	0.00	0.04	0.05	0.00	0.73	0.00	0.00	0.12
C.3.6.	0.68	0.36	0.00	0.00	0.11	3.45	1.24	1.79	0.01	0.07	1.26	0.73	0.00	0.88	0.74
C.3.6./D.3.4.	0.00	0.00	0.00	0.27	0.17	0.00	0.00	0.00	0.01	0.01	0.63	0.73	0.00	0.88	0.62

C.4.1.	0.00	0.36	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.12
D.1.1./E.1.1.	0.00	1.46	1.65	0.27	0.62	0.00	0.00	1.79	0.05	0.07	0.00	0.00	1.14	0.59	0.49
D.1.2.	0.00	0.36	0.00	0.00	0.06	0.00	0.00	0.00	0.15	0.14	0.00	0.73	0.00	0.00	0.12
D.3.4.	0.00	0.36	0.00	0.45	0.34	0.00	1.86	0.00	0.03	0.06	0.00	0.00	0.00	0.88	0.37
I.2.1./D.3.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.1.1./E.1.2.	0.00	1.82	0.00	0.81	0.79	0.00	1.24	0.00	0.30	0.31	0.00	1.46	0.00	0.00	0.25
E.2.1.	0.00	2.19	0.00	0.81	0.84	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.29	0.12
E.2.2.	0.00	0.00	0.41	0.72	0.51	0.00	0.00	0.00	0.20	0.19	0.00	0.00	0.00	0.29	0.12
E.3.1.	3.40	9.49	0.83	6.27	5.79	1.72	18.63	1.79	45.14	44.02	1.89	12.41	0.00	2.36	3.45
E.3.2.	0.00	1.82	3.72	2.96	2.64	0.00	2.48	3.57	8.24	8.05	0.00	0.00	0.00	2.65	1.11
E.3.4.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00
E.3.5.	0.68	1.82	0.00	1.34	1.18	0.00	2.48	0.00	4.24	4.14	0.63	4.38	0.00	0.88	1.23
E.7.4./E.3.5.	0.00	0.00	0.00	0.09	0.06	0.00	0.62	0.00	0.01	0.02	0.00	0.73	0.00	0.00	0.12
E.4.1.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	2.93	2.83	0.00	0.00	0.00	0.00	0.00
E.4.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
E.4.5.	0.68	17.52	4.13	10.04	9.61	1.72	22.98	5.36	10.17	10.27	0.63	10.22	0.57	2.65	3.08
E.4.6.	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
E.5.1.	0.68	4.38	0.41	0.36	1.01	0.00	1.86	0.00	0.05	0.08	0.00	0.73	0.00	0.00	0.12
E.5.2.	0.00	14.96	1.24	6.81	6.75	0.00	0.62	0.00	0.03	0.04	0.63	4.38	1.14	2.36	2.10
E.6.1.	0.00	0.36	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.7.2.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.7.3.	0.00	0.36	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.7.4.	0.00	0.00	0.00	0.18	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E.8.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.00	7.30	3.41	1.77	0.74
E.8.2.	0.00	0.00	0.83	0.18	0.22	0.00	0.62	4.46	0.05	0.11	1.26	2.92	1.70	1.47	1.73
E.9.2.	0.68	0.73	0.00	0.54	0.51	0.00	0.62	3.57	0.65	0.67	0.63	0.00	0.00	0.29	0.25
E.9.3.	0.00	0.00	0.83	1.25	0.90	0.00	0.00	1.79	0.84	0.83	0.00	0.00	1.14	0.88	0.62
G.3.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
I.2.1.	6.12	6.93	9.92	21.68	16.53	5.17	9.32	16.07	10.74	10.74	5.66	11.68	7.39	18.58	12.45

I.2.1./J.1.1./I.8.1.	12.24	2.19	1.65	2.42	3.09	0.00	0.00	0.00	0.00	0.00	11.95	4.38	1.14	1.18	3.82
I.3.1.	0.68	4.74	6.20	8.33	6.86	1.72	4.35	5.36	7.86	7.75	3.14	2.92	1.14	7.08	4.32
I.5.1.	0.00	0.00	0.00	0.18	0.11	1.72	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.29	0.12
I.5.1./I.5.2.	0.00	0.36	0.00	0.00	0.06	0.00	1.24	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00
I.5.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I.5.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.05	0.06	0.63	0.00	2.27	0.00	0.62
I.8.1.	2.04	5.47	5.79	7.71	6.63	3.45	2.48	9.82	0.89	1.02	4.40	0.00	0.00	10.03	7.03
J.1.1.	34.69	2.55	3.31	3.67	6.01	37.93	2.48	0.89	0.78	1.01	32.08	2.19	0.57	6.49	9.49
J.1.1./J.1.3.	10.20	1.09	0.41	0.45	1.35	5.17	0.00	0.89	0.28	0.31	5.03	1.46	0.57	2.65	2.47
J.1.3.	4.76	0.00	0.00	0.54	0.73	6.90	0.00	0.00	0.02	0.06	4.40	0.00	0.00	0.88	1.23
J.2.1.	6.12	5.84	27.69	6.54	9.27	17.24	5.59	19.64	0.57	0.94	13.21	8.03	48.30	9.14	18.25
J.2.2.	8.84	4.74	11.57	2.15	4.38	3.45	4.35	11.61	0.18	0.39	6.29	8.03	19.89	14.16	12.82
J.2.3.	3.40	0.00	0.83	0.09	0.45	1.72	0.62	0.00	0.01	0.03	1.26	1.46	1.70	0.00	0.86
J.4.1.	2.04	0.00	0.83	0.18	0.39	0.00	0.00	1.79	0.00	0.02	0.63	0.00	1.70	0.00	0.49
J.4.2.	0.00	0.36	0.00	0.00	0.06	0.00	0.62	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
J.4.3.	0.00	0.36	0.41	0.27	0.28	0.00	0.00	0.00	0.05	0.05	0.00	0.73	0.00	0.00	0.12
J.4.4.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J.5.2.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

***NKS nomenclature with a comparison to Physis.**

NKS code	Habitat description (NKS)	Physis code	Habitat description (Physis)
A.1.1.	Stalne stajaćice	22.1	Permanent freshwater ponds and lakes
A.1.3./A.4.1./J.4.4.	Neobrasle i slabo obrasle obale stajaćica / Tršćaci, rogozici, visoki šiljevi i visoki šaševi / Infrastrukturne površine	22.26	Lake muds, sands and shingles / Water-fringe vegetation / Active industrial constructions
A.2.3.	Stalni vodotoci	24.12-24.15	Rivers and streams
A.2.7.	Neobrasle i slabo obrasle obale tekućica	24.21/24.31/24.51/24.6	River gravels
A.2.7./A.2.2./A.1.1.	Neobrasle i slabo obrasle obale tekućica / Povremeni vodotoci / Stalne stajaćice		River gravels/ Intermittent streams / Permanent freshwater ponds and lakes
A.4.1.	Tršćaci, rogozici, visoki šiljevi i visoki šaševi	53	Water-fringe vegetation
B.1.4./B.2.2.	Tirensko-jadranske vapnenačke stijene / Ilirsko-jadranska, primorska točila	62.11 / 61.52	Tyrrheno-Adriatic eumediterranean calcicolous chasmophyte communities / Illyrian sub-Mediterranean screes
C.2.2.	Vlažne livade Srednje Europe	37.2	Eutrophic humid grasslands
C.2.3.	Mezofilne livade Srednje Europe	38.1-38.2	Mesophile grasslands
C.2.3./C.2.2./ E.3.1.	Mezofilne livade Srednje Europe / Vlažne livade Srednje Europe / Mješovite hrastovo-grabove i čiste grabove šume		Mesophile grasslands / Eutrophic humid grasslands / Western Palearctic oak-hornbeam forests
C.2.4.	Vlažni, nitrofilni travnjaci i pašnjaci	37.24	Flood swards and related communities
C.3.3.	Subatlantski mezofilni travnjaci i brdske livade na karbonatnim tlima	34.32	Sub-Atlantic semidry calcareous grasslands
C.3.3./C.2.3.	Subatlantski mezofilni travnjaci i brdske livade na karbonatnim tlima / Mezofilne livade Srednje Europe		Sub-Atlantic semidry calcareous grasslands / Mesophile grasslands
C.3.4.	Europske suhe vrištine i travnjaci trave tvrdaèe	31.2 /35.1	European dry heaths
C.3.5.	Submediteranski i epimediteranski suhi travnjaci	34.75	Eastern sub-Mediterranean dry grasslands
C.3.5./D.3.1.	Submediteranski i epimediteranski suhi travnjaci / Dračici		Eastern sub-Mediterranean dry grasslands / Illyrio-Adriatic deciduous thickets
C.3.5./D.3.4.	Submediteranski i epimediteranski suhi travnjaci / Bušici		Eastern sub-Mediterranean dry grasslands / Illyrian garrigues
C.3.5./E.3.5.	Submediteranski i epimediteranski suhi travnjaci / Primorske termofilne šume i šikare medunca		Eastern sub-Mediterranean dry grasslands / Dalmatian white oak woods
C.3.6.	Kamenjarski pašnjaci i suhi travnjaci eu- i stenomediterana	34.53	East Mediterranean xeric grasslands
C.3.6./D.3.4.	Kamenjarski pašnjaci i suhi travnjaci eu- i stenomediterana / Bušici		East Mediterranean xeric grasslands / Illyrian garrigues

C.4.1.	Planinske rudine	36.4	Boreo-Alpic calciphilous alpine grasslands
D.1.1./E.1.1.	Vrbici na sprudovima / Poplavne šume vrba	44.11 44.13	Orogenous riverine brush / Middle European white willow forests
D.1.2.	Mezofilne živice i šikare kontinentalnih, izuzetno primorskih krajeva	31.8	Western Palaearctic temperate thickets
D.3.1./C.3.5.	Dračici / Submediteranski i epimediteranski suhi travnjaci	31.8B2	Illyrio-Adriatic deciduous thickets / Eastern sub-Mediterranean dry grasslands
D.3.4.	Bušici	32.B	Illyrian garrigues
D.3.4./C.3.5.	Bušici / Submediteranski i epimediteranski suhi travnjaci		Illyrian garrigues / Eastern sub-Mediterranean dry grasslands
E.1.1./E.1.2.	Poplavne šume vrba / Poplavne šume topola	44.13 44.14	Middle European white willow forests / Mediterranean tall willow galleries
E.2.1.	Poplavne šume crne johe i poljskog jasena	44.3	Middle European stream ash-alder woods
E.2.2.	Poplavne šume hrasta lužnjaka	44.43	Southeast European ash-oak-alder forests
E.3.1.	Mješovite hrastovo-grabove i čiste grabove šume	41.21	Western Palaearctic oak-hornbeam forests
E.3.2.	Srednjoeuropske acidofilne šume hrasta kitnjaka, te obične breze	41.57	Medio-European acidophilous oak forests
E.3.4.	Srednjoeuropske termofilne hrastove šume	41.74	Italo-Illyrian hop-hornbeam sub-thermophilous oak woods
E.3.5.	Primorske, termofilne šume i šikare medunca	41.736	Dalmatian white oak woods
E.3.5./C.3.5.	Primorske, termofilne šume i šikare medunca / Submediteranski i epimediteranski suhi travnjaci		Dalmatian white oak woods / Eastern sub-Mediterranean dry grasslands
E.4.1.	Srednjoeuropske neutrofilne do slaboacidofilne, mezofilne bukove šume	41.1C2	Illyrian neutrophile beech forests
E.4.2.	Srednjoeuropske, acidofilne bukove šume	41.1C1	Illyrian woodrush-beech forests
E.4.5.	Mezofilne i neutrofilne čiste bukove šume	41.1C221	Illyrian low-montane acidocline fir-beech forests
E.4.6.	Jugoistočnoalpsko-ilirske, termofilne bukove šume	41.1C3	Illyrian thermophile beech forests
E.5.1.	Panonske bukovo-jelove šume	41.1C221	Illyrian low-montane acidocline fir-beech forests
E.5.2.	Dinarske bukovo-jelove šume	41.1C222	Illyrian low-montane neutrophile fir-beech forests
E.6.1.	Pretplaninske bukove šume	41.1C223	Illyrian high-montane fir-beech forests
E.7.2.	Acidofilne jelove šume	42.13	Acidophile medio-European fir forests
E.7.3.	Smrekove šume	42.25	Peri-Alpine spruce forests
E.7.4.	Šume običnog i crnog bora na dolomitima	42.62	Western Balkanic black pine forests
E.7.4./E.3.5.	Šume obiènog i crnog bora na dolomitima / Primorske, termofilne šume i šikare medunca		Western Balkanic black pine forests / Dalmatian white oak woods

E.8.1.	Mješovite, rjeđe čiste vazdazelene šume i makija crnike ili oštrike	45.3	Holm-oak forests
E.8.2.	Stenomediteranske čiste vazdazelene šume i makija crnike	45.3	Holm-oak forests
E.9.2.	Nasadi četinjača	83.31	Conifer plantations
E.9.3.	Nasadi širokolisnog drveća	83.32	Plantations of broad-leaved trees
G.3.1.	Infralitoralni pjeskoviti muljevi, pijesci, šljunci i stijene u eurihalinom i euritermnom okolišu	11.221	Soft seabed euryhaline and eurythermal communities
I.2.1	Mozaici kultiviranih površina	84.4	Rural mosaics
I.2.1./C.3.5.	Mozaici kultiviranih površina / Submediteranski i epimediteranski suhi travnjaci		Rural mosaics / Eastern sub-Mediterranean dry grasslands
I.2.1./D.3.4.	Mozaici kultiviranih površina / Bušici		Rural mosaics / Illyrian garrigues
I.2.1./J.1.1./ I.8.1.	Mozaici kultiviranih površina / Aktivna seoska područja / Javne neproizvodne kultivirane zelene površine		Rural mosaics / Villages / Parks and city squares
I.3.1.	Intenzivno obrađivane oranice na komasiranim površinama	82.11	Field crops
I.5.1.	Voćnjaci	83.15	Fruit orchards
I.5.1./I.5.2.	Voćnjaci / Maslinici		Fruit orchards / Olive groves
I.5.2.	Maslinici	83.11	Olive groves
I.5.3.	Vinogradi	83.21	Vineyards
I.8.1.	Javne neproizvodne kultivirane zelene površine	85.1 85.2	Parks and city squares
J.1.1.	Aktivna seoska područja	86.2	Villages
J.1.1./J.1.3.	Aktivna seoska područja / Urbanizirana seoska područja		Villages / Suburban areas
J.1.3.	Urbanizirana seoska područja	86.12	Suburban areas
J.2.1.	Gradske jezgre	86.11	Urban centers
J.2.2.	Gradske stambene površine	86.12	Suburban areas
J.2.3.	Ostale urbane površine	86.13-14	Town features
J.4.1.	Industrijska i obrtnička područja	86.32	Active industrial constructions
J.4.2.	Odlagališta krutih tvari	86.43	Marginal and disused industrial sites
J.4.3.	Površinski kopovi	86.31	Active extraction sites
J.4.4.	Infrastrukturne površine	86.32	Active industrial constructions
J.5.2.	Umjetna slatkovodna staništa	89.2	Fresh water industrial lagoons and canals

Appendix 5. Frequencies of different habitat types according to the Croatian National Habitat Classification and the map of terrestrial non-forest habitats (2016) in six studied invasive species.

NKS code	*A. altissima*					*A. artemisiifolia*					*E. lobata*				
	ID 5	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**
A.1.1.	0.00	0.00	0.00	0.99	0.61	1.56	0.92	2.60	2.01	1.93	0.00	14.29	0.00	6.52	4.84
A.1.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
A.1.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
A.2.3.	0.00	0.00	0.00	0.33	0.20	0.78	1.83	0.65	0.57	0.79	0.00	4.76	7.50	10.87	7.53
A.2.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	0.40	0.61	3.03	0.00	5.00	2.17	2.69
A.2.7.	0.00	0.00	2.82	0.00	0.40	0.00	0.00	1.30	0.00	0.18	0.00	0.00	0.00	1.09	0.54
A.3.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A.3.6.	0.00	0.00	0.00	0.33	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A.4.1.	0.00	0.00	0.00	0.33	0.20	0.00	0.00	1.30	1.34	0.97	0.00	0.00	0.00	5.43	2.69
B.1.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
B.1.4.	1.89	1.47	0.00	0.99	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B.2.2.1.	0.00	2.94	0.00	0.33	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B.3.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.1.1.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.2.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.2.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	3.26	1.61
C.2.3.2.	0.00	2.94	2.82	1.32	1.62	0.00	11.93	11.04	11.90	10.45	3.03	0.00	15.00	5.43	6.45
C.2.3.2.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.65	4.28	2.99	0.00	14.29	2.50	1.09	2.69
C.2.3.2.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.3.2.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.13	0.18	0.00	0.00	0.00	0.00	0.00

C.2.3.2.5.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.3.2.7.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.2.4.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.79	0.13	1.14	0.00	0.00	12.50	1.09	3.23
C.2.5.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.13	0.26	0.00	0.00	0.00	0.00	0.00
C.2.5.1.6.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.3.2.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.09	0.00	0.00	0.00	0.00	0.00
C.3.3.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.65	2.14	1.58	0.00	0.00	0.00	0.00	0.00
C.3.4.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.3.4.3.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.3.5.1.	1.89	8.82	1.41	13.20	9.70	0.78	0.00	0.65	0.13	0.26	0.00	0.00	0.00	0.00	0.00
C.3.5.2.	0.00	2.94	0.00	0.33	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.3.5.3.	0.00	1.47	0.00	0.33	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.3.6.1.	5.66	2.94	1.41	2.64	2.83	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
C.4.1.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.5.4.1.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.27	0.26	0.00	0.00	0.00	0.00	0.00
D.1.1.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.1.1.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.1.2.1.	0.00	1.47	4.23	0.99	1.41	0.78	5.50	3.25	2.14	2.46	0.00	4.76	5.00	2.17	2.69
D.3.1.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.3.4.2.	0.00	0.00	0.00	4.62	2.83	0.00	0.00	0.00	0.13	0.09	0.00	0.00	0.00	0.00	0.00
D.3.4.2.3.	0.00	1.47	2.82	0.00	0.61	0.00	0.92	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
D.4.1.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90	0.00	0.53	3.03	0.00	7.50	1.09	2.69
E.	16.98	42.65	18.31	44.55	37.58	3.91	42.20	12.99	21.26	20.19	12.12	23.81	17.50	47.83	32.26
F.3.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F.4.1.	0.00	0.00	0.00	2.31	1.41	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00
I.1.4.	0.00	0.00	0.00	0.33	0.20	0.00	0.00	0.65	0.53	0.44	0.00	0.00	0.00	0.00	0.00
I.1.7.	0.00	0.00	0.00	0.33	0.20	0.00	2.75	0.00	0.53	0.61	0.00	0.00	0.00	1.09	0.54
I.1.8.	1.89	1.47	2.82	0.66	1.21	0.78	0.92	0.00	4.81	3.34	3.03	4.76	2.50	3.23	3.23
I.2.1.	7.55	4.41	1.41	1.32	2.42	7.81	11.93	11.69	17.38	15.01	12.12	14.29	10.00	4.35	8.06

I.5.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	1.07	0.79	9.09	0.00	0.00	0.00	1.61
I.5.2.	3.77	7.35	2.82	1.65	2.83	0.00	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00
I.5.3.	1.89	0.00	0.00	0.66	0.61	0.78	0.00	0.00	0.40	0.35	0.00	0.00	0.00	0.00	0.00
J.	58.49	17.65	59.15	21.45	30.30	82.81	16.51	35.71	26.74	33.27	54.55	19.05	15.00	3.26	16.67

NKS code	*E. annuus*					*R. pseudoacacia*					*V. persica*				
	ID 5	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**	**ID 5**	**ID 6**	**ID 7**	**ID 11**	**all**
A.1.1.	0.00	0.37	1.23	1.70	1.29	0.00	0.63	0.88	0.05	0.07	0.00	1.46	0.57	1.74	1.10
A.1.2.	0.00	0.00	0.00	0.18	0.11	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00
A.1.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A.2.3.	0.00	0.00	1.65	1.25	1.01	0.00	0.63	1.77	0.15	0.17	0.63	0.73	1.14	0.58	0.73
A.2.4.	0.00	0.00	1.23	0.27	0.39	0.00	0.00	0.00	0.08	0.08	0.63	0.00	0.57	0.00	0.24
A.2.7.	0.00	0.00	0.82	0.00	0.11	0.00	0.00	1.77	0.00	0.02	0.00	0.00	1.14	0.00	0.24
A.3.3.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.12
A.3.6.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A.4.1.	0.00	1.10	0.41	1.43	1.12	0.00	0.00	0.00	0.06	0.06	0.63	0.73	0.00	0.29	0.37
B.1.3.	0.00	0.37	0.00	0.09	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B.1.4.	0.00	0.37	0.00	0.00	0.06	0.00	0.63	0.00	0.00	0.01	0.63	0.00	0.00	0.00	0.12
B.2.2.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.01	0.63	0.00	0.00	0.00	0.12
B.3.1.	0.00	0.37	0.00	0.00	0.06	0.00	0.63	0.00	0.00	0.01	0.00	0.73	0.00	0.00	0.12
C.1.1.1.	0.00	0.00	0.41	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.2.	0.00	0.00	0.00	0.18	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.2.3.	0.00	0.00	0.41	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.2.4.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.2.4.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
C.2.3.2.	7.53	8.06	9.47	13.77	11.80	5.17	8.75	8.85	0.63	0.87	5.63	8.76	3.98	15.65	10.02
C.2.3.2.1.	0.00	1.83	0.41	3.40	2.47	1.72	1.88	0.88	0.07	0.12	0.00	3.65	0.00	3.77	2.20

C.2.3.2.3.	0.00	0.00	0.41	0.09	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.3.2.4.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.3.2.5.	0.00	0.00	0.00	0.18	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.3.2.7.	0.00	0.00	0.00	0.18	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.4.1.	0.68	0.37	4.94	0.00	0.79	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00
C.2.5.1.	0.00	0.00	0.41	0.36	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.2.5.1.6.	0.00	0.00	0.00	0.36	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.12
C.3.2.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.01	0.00	0.00	0.00	0.00	0.00
C.3.3.1.	0.68	0.37	0.82	5.81	3.88	0.00	0.00	0.00	0.25	0.24	2.50	3.65	1.14	0.87	1.71
C.3.4.3.	0.00	0.00	0.00	0.54	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.3.4.3.4.	0.00	0.37	0.00	0.36	0.28	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
C.3.5.1.	0.68	1.47	0.00	0.72	0.73	1.72	3.13	0.88	0.07	0.14	0.63	1.46	0.00	2.03	1.22
C.3.5.2.	0.00	0.37	0.00	0.27	0.22	0.00	0.63	0.88	0.01	0.03	0.00	0.00	0.00	0.29	0.12
C.3.5.3.	0.00	0.37	0.41	0.18	0.22	0.00	0.63	0.00	0.08	0.09	0.00	0.73	1.14	0.29	0.49
C.3.6.1.	0.00	0.37	0.41	0.09	0.17	0.00	3.13	0.00	0.03	0.08	0.00	0.00	0.00	0.00	0.00
C.4.1.2.	0.00	0.37	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C.5.4.1.1.	0.00	0.37	0.41	0.18	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.1.1.1.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
D.1.1.2.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
D.1.2.1.	0.00	2.20	3.29	3.67	3.09	0.00	2.50	3.54	1.21	1.26	0.63	2.92	1.70	1.74	1.71
D.3.1.1.	0.00	0.00	0.00	0.09	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.3.4.2.	0.00	0.00	0.00	0.27	0.17	0.00	0.63	0.00	0.03	0.04	0.00	0.00	0.00	2.32	0.98
D.3.4.2.3.	0.00	0.37	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.4.1.1.	0.00	0.00	3.70	0.00	0.51	0.00	0.00	2.65	0.02	0.05	0.00	0.00	1.14	0.00	0.24
E.	8.22	56.04	19.34	33.27	32.81	8.62	54.38	28.32	94.34	93.06	11.25	35.77	11.36	17.10	17.85
F.3.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.12
F.4.1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.01	0.02	0.00	0.00	0.00	0.87	0.37
I.1.4.	0.00	0.00	0.41	0.36	0.28	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
I.1.7.	2.05	2.56	0.00	0.18	0.67	0.00	0.00	0.00	0.05	0.05	0.00	1.46	0.00	0.58	0.49

I.1.8.	0.68	1.47	0.41	3.67	2.64	0.00	0.63	1.77	0.45	0.46	1.25	1.46	1.14	5.22	2.93
I.2.1.	8.90	7.69	6.58	13.15	11.07	8.62	6.88	13.27	1.20	1.47	10.00	8.03	7.95	15.07	11.37
I.5.1.	1.37	0.73	0.82	0.98	0.96	0.00	0.63	0.00	0.09	0.10	0.00	1.46	0.00	2.03	1.10
I.5.2.	0.00	0.37	0.41	0.09	0.17	3.45	1.25	2.65	0.04	0.11	0.63	1.46	0.00	1.16	0.86
I.5.3.	1.37	0.00	0.00	1.25	0.90	0.00	0.00	0.00	0.06	0.06	0.00	0.00	1.14	0.87	0.61
J.	67.81	11.36	41.15	11.18	19.94	70.69	11.88	30.09	0.89	1.77	63.75	25.55	65.91	26.96	42.30

***NKS nomenclature with a comparison to Physis.**

NKS code	Habitat description (NKS)	Physis code	Habitat description (Physis)
A.1.1.	Stalne stajaćice	22.1	Permanent freshwater ponds and lakes
A.1.2.	Povremene stajaćice	22.2	Temporary freshwater bodies
A.1.3.	Neobrasle i slabo obrasle obale stajaćica	22.26	Lake muds, sands and shingles
A.2.3.	Stalni vodotoci	24.12-15	Rivers and streams
A.2.4.	Kanali		Channels
A.2.7.	Neobrasle i slabo obrasle obale tekućica	24.21/31/51/6	River gravels
A.3.3.	Zakorijenjena vodenjarska vegetacija	22.42-43	Euhydrophytic river vegetation
A.3.6.	Sedrotvorna vegetacija na slapovima		Tuffa barriers on waterfalls
A.4.1.	Tršćaci, rogozici, visoki šiljevi i visoki šaševi	53	Water-fringe vegetation
B.1.3.	Alpsko-karpatsko-balkanske vapnenačke stijene	62.1A	Illyrio-Helleno-Balkanic cinquefoil cliffs
B.1.4.	Tirensko-jadranske vapnenačke stijene	62.11	Tyrrheno-Adriatic eumediterranean calcicolous chasmophyte communities

B.2.2.1.	Ilirsko-jadranska, primorska točila	61.52	Illyrian sub-Mediterranean screes
B.3.1.	Požarišta		Burnt areas
C.1.1.1.	Bazofilni cretovi (niski cretovi)	54.2	Rich fens
C.2.2.2.	Trajno vlažne livade Srednje Europe	37.31	Purple moorgrass meadows and related communities
C.2.2.2.3.	Livade plućne sirištare i primorske beskoljenke	37.313	Giant moorgrass swards
C.2.2.2.4.	Livade-košanice obične beskoljenke i panonskog grašara		Purple moorgrass meadows and related communities
C.2.2.4.	Periodički vlažne livade	37.26	Continental humid meadows
C.2.3.2.	Mezofilne livade košanice Srednje Europe	38.22,25	Lowland and collinar hay meadows
C.2.3.2.1.	Srednjoeuropske livade rane pahovke	38.222	Hygromesophile medio-European lowland hay meadows
C.2.3.2.3.	Livade brdske zečine i rane pahovke		Lowland and collinar hay meadows
C.2.3.2.4.	Livade gomoljaste končare i rane pahovke	38.251	Ponto-Pannonic mesophile hay meadows
C.2.3.2.5.	Livade šuškavca i končare		Lowland and collinar hay meadows
C.2.3.2.7.	Nizinske košanice s ljekovitom krvarom		Lowland and collinar hay meadows
C.2.4.1.	Nitrofilni pašnjaci i livade-košanice nizinskog vegetacijskog pojasa	37.24	Flood swards and related communities
C.2.5.1.	Ilirsko-submediteranske livade rječnih dolina	37.63	Dalmatian riverine and humid meadows
C.2.5.1.6.	Livada sitne busike s livadnim procjepkom		Dalmatian riverine and humid meadows
C.3.2.1.	Panonski otvoreni travnjaci na pijescima	64.71	Pannonic inland dunes
C.3.3.1.	Brdske livade uspravnog ovsika na karbonatnoj podlozi	34.329	Illyrian *Mesobromion* grasslands
C.3.4.3.	Vrištine vlasaste vlasulje		Festuca capillata dominated grasslands
C.3.4.3.4.	Bujadnice		Pteridium aquilinum fern stands
C.3.5.1.	Istočnojadranski kamenjarski pašnjaci submediteranske zone	34.751	Lowland savory-chrysopogon dry grasslands

C.3.5.2.	Istočnojadranski kamenjarski pašnjaci epimediteranske zone	34.752	Mountain savory-chrysopogon dry grasslands
C.3.5.3.	Travnjaci vlasastog zmijka	34.753	Viper's grass dry grasslands
C.3.6.1.	Eu- i stenomediteranski kamenjarski pašnjaci raščice	34.53	East Mediterranean xeric grasslands
C.4.1.2.	Pretplaninske rudine oštre vlasulje	36.417	Dinaro-Moesian oligophile closed calcicolous grasslands
C.5.4.1.1.	Visoke zeleni s pravom končarom	37.11	Western nemoral tall herb communities
D.1.1.1.	Vrbici šljunkovitih i pjeskovitih riječnih sprudova	44.11	Orogenous riverine brush
D.1.1.2.	Vrbici pepeljaste i uškaste vrbe		Orogenous riverine brush
D.1.2.1.	Mezofilne živice i šikare kontinentalnih, izuzetno primorskih krajeva	31.8	Western Palaearctic temperate thickets
D.3.1.1.	Dračici	31.8B2	Illyrio-Adriatic deciduous thickets
D.3.4.2.	Istočnojadranski bušici	32.B3	Illyrian *Cistus* garrigues
D.3.4.2.3.	Sastojine oštroigličaste borovice		Garrigues dominated by Juniperus oxycedrus
D.4.1.1.	Sastojine čivitnjače		Amorpha fruticosa L. stands
E.	Šume		Forests
F.3.1.	Površine šljunčanih žalova pod halofitima	17.2	Shingle beach drift lines and pioneer swards
F.4.1.	Površine stjenovitih obala pod halofitima	18.2	Sea-cliff and rocky shore aerohaline communities
I.1.4.	Ruderalne zajednice kontinentalnih krajeva	87.2	Ruderal communities
I.1.7.	Zajednice nitrofilnih, higrofilnih i skiofilnih staništa	22.33	Bur marigold communities
I.1.8.	Zapuštene poljoprivredne površine		Abandoned agricultural areas
I.2.1.	Mozaici kultiviranih površina	84.4	Rural mosaics
I.5.1	Voćnjaci	83.15	Fruit orchards
I.5.3.	Vinogradi	83.21	Vineyards

J.	Izgrađena i industrijska staništa	86, 89	Towns, villages, industrial sites

Appendix 6. Results of Friedman ANOVA

Friedman ANOVA and Kendall Coeff. of Concordance (*Ailanthus* in CLC) ANOVA Chi Sqr. (N = 21, df = 4) = 3.471883 p = 0.48217 Coeff. of Concordance = 0.04133 Aver. rank r = -0.0066				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.738095	57.50000	4.673721	10.93407
ID 6	3.047619	64.00000	4.761905	5.72680
ID 7	2.642857	55.50000	4.761905	9.18739
ID 11	3.428571	72.00000	4.761905	5.04909
All	3.142857	66.00000	4.611033	5.53186

Friedman ANOVA and Kendall Coeff. of Concordance (*Ambrosia* in CLC) ANOVA Chi Sqr. (N = 25, df = 4) = 13.99566 p =0 .00731 Coeff. of Concordance = 0.13996 Aver. rank r = 0.10412				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.220000	55.50000	4.000000	13.17420
ID 6	2.980000	74.50000	4.000000	6.97630
ID 7	2.720000	68.00000	4.000000	7.23251
ID 11	3.440000	86.00000	4.000000	6.89842
all	3.640000	91.00000	4.000000	6.97696

Friedman ANOVA and Kendall Coeff. of Concordance (*Echinocystis* in CLC) ANOVA Chi Sqr. (N = 14, df = 4) = 1.267925 p = 0.86679 Coeff. of Concordance = 0.02264 Aver. rank r = -0.0525				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.607143	36.50000	7.142857	12.94449
ID 6	3.107143	43.50000	7.142857	6.92589
ID 7	3.035714	42.50000	7.142857	8.25420
ID 11	3.035714	42.50000	7.066052	7.52941
all	3.214286	45.00000	7.104660	5.68429

Friedman ANOVA and Kendall Coeff. of Concordance (*Erigeron* in CLC) ANOVA Chi Sqr. (N = 25, df = 4) = 18.44255 p = 0.00101 Coeff. of Concordance = 0.18443 Aver. rank r = 0.15044				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	1.980000	49.50000	4.000000	11.40736
ID 6	3.000000	75.00000	4.000000	7.05372
ID 7	2.860000	71.50000	4.000000	7.62939
ID 11	3.560000	89.00000	4.000000	5.81822
all	3.600000	90.00000	4.000000	5.71318

Friedman ANOVA and Kendall Coeff. of Concordance (*Robinia* in CLC) ANOVA Chi Sqr. (N = 26, df = 4) = 6.163265 p = 0.18729 Coeff. of Concordance = 0.05926 Aver. rank r = 0.02163				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.403846	62.50000	3.846154	11.61519
ID 6	3.230769	84.00000	3.846154	8.55745
ID 7	2.961538	77.00000	3.846154	7.40383
ID 11	3.019231	78.50000	3.846154	11.67348
all	3.384615	88.00000	3.846154	11.45751

Friedman ANOVA and Kendall Coeff. of Concordance (*Veronica* in CLC) ANOVA Chi Sqr. (N = 23, df = 4) = 9.426637 p = 0.05128 Coeff. of Concordance = 0.10246 Aver. rank r = 0.06167				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.695652	62.00000	4.347826	10.14915
ID 6	3.130435	72.00000	4.347826	6.34073
ID 7	2.304348	53.00000	4.347826	11.10442
ID 11	3.521739	81.00000	4.347826	7.07649
all	3.347826	77.00000	4.347826	7.55360

Friedman ANOVA and Kendall Coeff. of Concordance (*Ailanthus* in Habitats04) ANOVA Chi Sqr. (N = 38, df = 4) = 9.963839 p = 0.04104 Coeff. of Concordance = 0.06555 Aver. rank r = 0.04030				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.578947	98.0000	2.631579	5.733100
ID 6	3.000000	114.0000	2.631579	3.808152
ID 7	2.657895	101.0000	2.631579	6.688256
ID 11	3.250000	123.5000	2.631579	3.829543
all	3.513158	133.5000	2.634980	3.475855

Friedman ANOVA and Kendall Coeff. of Concordance (*Ambrosia* in Habitats04) ANOVA Chi Sqr. (N = 48, df = 4) = 28.76731 p = 0.00001 Coeff. of Concordance = 0.14983 Aver. rank r = 0.13174				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.260417	108.5000	2.083333	6.562843
ID 6	3.031250	145.5000	2.083333	3.731375
ID 7	2.572917	123.5000	2.083333	4.682454
ID 11	3.572917	171.5000	2.083333	4.144328
all	3.562500	171.0000	2.083333	3.768395

Friedman ANOVA and Kendall Coeff. of Concordance (*Echinocystis* in Habitats04) ANOVA Chi Sqr. (N = 26, df = 4) = 11.94947 p = 0.01773 Coeff. of Concordance = 0.11490 Aver. rank r = 0.07949				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.500000	65.00000	3.846154	7.596708
ID 6	2.442308	63.50000	3.846154	6.600932
ID 7	3.076923	80.00000	3.846154	5.667044
ID 11	3.519231	91.50000	3.846154	3.641328
all	3.461538	90.00000	3.846154	3.208196

Friedman ANOVA and Kendall Coeff. of Concordance (*Erigeron* in Habitats04) ANOVA Chi Sqr. (N = 59, df = 4) = 41.53278 p = 0.00000 Coeff. of Concordance = 0.17599 Aver. rank r = 0.16178				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.161017	127.5000	1.694915	5.086571
ID 6	3.000000	177.0000	1.694915	3.384371
ID 7	2.610169	154.0000	1.694915	4.192841
ID 11	3.567797	210.5000	1.694915	3.510050
all	3.661017	216.0000	1.694915	3.065129

Friedman ANOVA and Kendall Coeff. of Concordance (*Robinia* in Habitats04) ANOVA Chi Sqr. (N = 57, df = 4) = 41.07308 p = 0.00000 Coeff. of Concordance = 0.18015 Aver. rank r = 0.16550				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.122807	121.0000	1.633394	5.571823
ID 6	3.078947	175.5000	1.689005	4.053877
ID 7	2.622807	149.5000	1.723058	3.884037
ID 11	3.456140	197.0000	1.724183	6.339858
all	3.719298	212.0000	1.723118	6.193698

Friedman ANOVA and Kendall Coeff. of Concordance (*Veronica* in Habitats04) ANOVA Chi Sqr. (N = 49, df = 4) = 20.76360 p =0.00035 Coeff. of Concordance = 0.10594 Aver. rank r = 0.08731				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.479592	121.5000	2.040816	5.215657
ID 6	3.102041	152.0000	2.040816	3.195531
ID 7	2.489796	122.0000	2.040816	7.387200
ID 11	3.438776	168.5000	2.040816	3.747221
all	3.489796	171.0000	2.040816	3.740780

Friedman ANOVA and Kendall Coeff. of Concordance (*Ailanthus* in Habitats16) ANOVA Chi Sqr. (N = 24, df = 4) = 8.701595 p = 0.06901 Coeff. of Concordance = 0.09064 Aver. rank r = 0.05110				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.541667	61.00000	4.167083	12.17658
ID 6	3.145833	75.50000	4.166250	9.11426
ID 7	2.500000	60.00000	4.167500	12.30193
ID 11	3.312500	79.50000	4.166250	9.88411
all	3.500000	84.00000	4.166667	9.43840

Friedman ANOVA and Kendall Coeff. of Concordance (*Ambrosia* in Habitats16) ANOVA Chi Sqr. (N = 37, df = 4) = 38.13213 p = 0.00000 Coeff. of Concordance = 0.25765 Aver. rank r = 0.23703				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	1.986486	73.5000	2.702466	13.61069
ID 6	2.662162	98.5000	2.702973	7.66608
ID 7	2.837838	105.0000	2.703243	6.54070
ID 11	3.810811	141.0000	2.702703	6.23534
all	3.702703	137.0000	2.702703	6.70163

Friedman ANOVA and Kendall Coeff. of Concordance (*Echinocystis* in Habitats16) ANOVA Chi Sqr. (N = 17, df = 4) = 5.496855 p = 0.24001 Coeff. of Concordance = 0.08084 Aver. rank r = 0.02339				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.411765	41.00000	5.882353	13.23019
ID 6	2.794118	47.50000	5.882941	7.99238
ID 7	2.970588	50.50000	5.882353	6.11997
ID 11	3.294118	56.00000	5.880588	11.13955
all	3.529412	60.00000	5.882353	7.82454

Friedman ANOVA and Kendall Coeff. of Concordance (*Erigeron* in Habitats16) ANOVA Chi Sqr. (N = 46, df = 4) = 39.47305 p =0.00000 Coeff. of Concordance = 0.21453 Aver. rank r = 0.19707				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	1.978261	91.0000	2.173261	10.10415
ID 6	2.782609	128.0000	2.167174	8.43315
ID 7	2.934783	135.0000	2.173043	6.73600
ID 11	3.630435	167.0000	2.174348	5.69611
all	3.673913	169.0000	2.173913	5.89647

Friedman ANOVA and Kendall Coeff. of Concordance (*Robinia* in Habitats16) ANOVA Chi Sqr. (N = 35, df = 4) = 17.30351 p = 0.00169 Coeff. of Concordance = 0.12360 Aver. rank r = 0.09782				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.114286	74.0000	2.856857	12.01051
ID 6	3.200000	112.0000	2.859429	9.34778
ID 7	3.057143	107.0000	2.856000	7.10630
ID 11	3.114286	109.0000	2.857429	15.92140
all	3.514286	123.0000	2.873749	15.69931

Friedman ANOVA and Kendall Coeff. of Concordance (*Veronica* in Habitats16) ANOVA Chi Sqr. (N = 29, df = 4) = 14.69680 p = 0.00537 Coeff. of Concordance = 0.12670 Aver. rank r = 0.09551				
	Average Rank	Sum of ranks	Mean	St. dev.
ID 5	2.448276	71.0000	3.450000	11.93514
ID 6	3.103448	90.0000	3.448621	7.97028
ID 7	2.431034	70.5000	3.448966	12.27642
ID 11	3.465517	100.5000	3.448621	6.57982
all	3.551724	103.0000	3.448276	8.49262

Appendix 7. Results of the Wilcoxon Matched Pairs test

Pair of Variables	Wilcoxon Matched Pairs Test (*Ambrosia* in CLC) Marked tests are significant at p <0.05000			
	ValID	T	Z	p-value
	N			
ID 5 & ID 6	19	69.0000	1.046297	0.295425
ID 5 & ID 7	14	29.0000	1.475247	0.140147
ID 5 & ID 11	23	61.0000	2.341951	0.019184
ID 5 & all	25	67.0000	2.569610	0.010182
ID 6 & ID 7	17	75.0000	0.071007	0.943392
ID 6 & ID 11	24	146.0000	0.114286	0.909011
ID 6 & all	25	160.0000	0.067267	0.946369
ID 7 & ID 11	22	119.5000	0.227260	0.820222
ID 7 & all	25	146.0000	0.443964	0.657069
ID 11 & all	25	160.0000	0.067267	0.946369

Pair of Variables	Wilcoxon Matched Pairs Test (*Erigeron* in CLC) Marked tests are significant at p <0.05000			
	ValID	T	Z	p-value
	N			
ID 5 & ID 6	20	63.0000	1.567972	0.116889
ID 5 & ID 7	17	51.0000	1.207122	0.227386
ID 5 & ID 11	21	44.0000	2.485172	0.012949
ID 5 & all	25	67.0000	2.569610	0.010182
ID 6 & ID 7	22	121.0000	0.178561	0.858282
ID 6 & ID 11	23	125.0000	0.395394	0.692552
ID 6 & all	25	119.0000	1.170451	0.241821
ID 7 & ID 11	23	104.0000	1.034108	0.301086
ID 7 & all	25	125.0000	1.009009	0.312971
ID 11 & all	25	117.0000	1.224264	0.220853

Pair of Variables	Wilcoxon Matched Pairs Test (*Ambrosia* in HM04) Marked tests are significant at p <0.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	32	189.0000	1.402420	0.160791
ID5 & ID7	28	152.0000	1.161343	0.245503
ID5 & ID11	43	312.0000	1.944067	0.051888
ID5 & all	48	355.0000	2.389775	0.016859
ID6 & ID7	34	260.0000	0.641119	0.521446
ID6 & ID11	47	559.0000	0.052911	0.957803
ID6 & all	48	569.0000	0.194874	0.845491
ID7 & ID11	43	295.0000	2.149342	0.031608
ID7 & all	48	365.0000	2.287210	0.022184
ID11 & all	48	527.0000	0.625649	0.531545

Pair of Variables	Wilcoxon Matched Pairs Test (*Erigeron* in HM04) Marked tests are significant at p <0.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	41	267.0000	2.118692	0.034117
ID5 & ID7	33	208.0000	1.295418	0.195177
ID5 & ID11	52	377.0000	2.841358	0.004492
ID5 & all	59	436.0000	3.389041	0.000701
ID6 & ID7	43	457.0000	0.193199	0.846803
ID6 & ID11	59	857.0000	0.211343	0.832620
ID6 & all	59	734.0000	1.139744	0.254394
ID7 & ID11	51	482.0000	1.696598	0.089774
ID7 & all	59	578.0000	2.317229	0.020492
ID11 & all	59	824.0000	0.460427	0.645210

Pair of Variables	Wilcoxon Matched Pairs Test (*Robinia* in HM04) Marked tests are significant at p <.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	35	230.0000	1.392227	0.163855
ID5 & ID7	26	115.0000	1.536578	0.124398
ID5 & ID11	54	442.0000	2.587371	0.009672
ID5 & all	58	525.0000	2.558846	0.010502
ID6 & ID7	39	376.0000	0.195370	0.845103
ID6 & ID11	56	657.0000	1.150149	0.250083
ID6 & all	58	694.0000	1.250389	0.211158
ID7 & ID11	55	679.0000	0.762448	0.445793
ID7 & all	58	699.0000	1.211677	0.225637
ID11 & all	57	469.0000	2.840412	0.004506

Pair of Variables	Wilcoxon Matched Pairs Test (*Veronica* in HM04) Marked tests are significant at p <.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	34	213.0000	1.444656	0.148556
ID5 & ID7	32	247.0000	0.317882	0.750575
ID5 & ID11	42	332.0000	1.494188	0.135128
ID5 & all	49	351.0000	2.601218	0.009290
ID6 & ID7	37	202.0000	2.255400	0.024109
ID6 & ID11	46	525.0000	0.169343	0.865527
ID6 & all	49	591.0000	0.213867	0.830651
ID7 & ID11	40	253.0000	2.110284	0.034835
ID7 & all	49	382.0000	2.292851	0.021857
ID11 & all	49	548.0000	0.641601	0.521133

Pair of Variables	Wilcoxon Matched Pairs Test (*Ambrosia* in HM16) Marked tests are significant at p <.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	17	26.0000	2.390574	0.016823
ID5 & ID7	21	41.0000	2.589445	0.009614
ID5 & ID11	32	84.0000	3.365809	0.000763
ID5 & all	37	81.0000	4.080840	0.000045
ID6 & ID7	25	148.0000	0.390150	0.696426
ID6 & ID11	34	200.0000	1.666910	0.095533
ID6 & all	37	252.0000	1.501085	0.133334
ID7 & ID11	35	268.0000	0.769820	0.441407
ID7 & all	37	343.0000	0.128233	0.897964
ID11 & all	37	312.0000	0.595908	0.551237

Pair of Variables	Wilcoxon Matched Pairs Test (*Erigeron* in HM16) Marked tests are significant at p <.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	26	89.0000	2.196925	0.028027
ID5 & ID7	28	123.0000	1.821714	0.068499
ID5 & ID11	38	128.0000	3.516802	0.000437
ID5 & all	46	149.0000	4.277284	0.000019
ID6 & ID7	34	247.0000	0.863374	0.387933
ID6 & ID11	42	346.0000	1.319137	0.187124
ID6 & all	46	350.0000	2.081284	0.037409
ID7 & ID11	42	341.0000	1.381655	0.167079
ID7 & all	46	457.0000	0.912269	0.361628
ID11 & all	46	375.0000	1.808149	0.070584

Pair of Variables	Wilcoxon Matched Pairs Test (*Robinia* in HM16) Marked tests are significant at p <.05000			
	ValID	T	Z	p-value
	N			
ID5 & ID6	19	46.0000	1.971867	0.048626
ID5 & ID7	16	22.0000	2.378603	0.017379
ID5 & ID11	30	159.0000	1.511773	0.130593
ID5 & all	35	189.0000	2.063772	0.039040
ID6 & ID7	23	112.0000	0.790789	0.429068
ID6 & ID11	33	139.0000	2.528298	0.011462
ID6 & all	35	172.0000	2.342217	0.019170
ID7 & ID11	32	168.0000	1.795098	0.072639
ID7 & all	35	225.0000	1.474123	0.140449
ID11 & all	35	115.0000	3.275829	0.001054

Pair of Variables	Wilcoxon Matched Pairs Test (*Veronica* in HM16) Marked tests are significant at p <.05000			
	ValID	T	Z	p-value
ID5 & ID6	21	59.0000	1.963807	0.049553
ID5 & ID7	20	101.0000	0.149331	0.881293
ID5 & ID11	26	92.0000	2.120731	0.033945
ID5 & all	29	113.0000	2.259625	0.023845
ID6 & ID7	21	63.0000	1.824777	0.068036
ID6 & ID11	23	111.0000	0.821204	0.411531
ID6 & all	29	215.0000	0.054058	0.956889
ID7 & ID11	25	85.0000	2.085286	0.037044
ID7 & all	29	120.0000	2.108262	0.035009
ID11 & all	29	157.0000	1.308204	0.190805

Appendix 8. Results of descriptive statistics of environmental variables.

Variable	All Groups Descriptive Statistics (*Ailanthus altissima*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	496	0.00	0.001	-0.7442	0.6	-0.0841	0.081	-0.1752	0.1	0.1	0.006
Northness	496	-0.13	-0.190	-0.9603	1.0	-0.5607	0.266	-0.8600	0.7	0.5	0.024
Slope	496	7.95	5.927	0.0000	29.3	1.4731	14.336	0.3680	17.6	7.1	0.319
Elevation	488	113.49	104.754	0.0000	930.1	36.4181	136.283	8.1615	242.1	110.3	4.995
Bio_1	430	12.90	13.300	7.5000	16.5	10.9000	14.500	10.7000	15.5	2.0	0.095
Bio_7	430	28.03	27.600	23.4000	31.9	26.1000	30.400	25.0000	30.9	2.3	0.109
Bio_10	430	21.51	21.400	15.9000	24.4	20.3000	22.600	19.9000	23.5	1.5	0.071
Bio_11	430	4.26	5.300	-1.1000	9.5	1.0000	6.800	0.7500	8.2	3.0	0.143
Bio_12	430	967.17	927.000	640.0000	1385.0	912.0000	1010.000	846.0000	1197.0	140.1	6.754
Bio_17	430	160.54	157.000	104.0000	286.0	140.0000	164.000	131.5000	195.0	30.3	1.462
Bio_18	430	203.90	189.500	104.0000	316.0	144.0000	277.000	132.0000	283.0	62.4	3.009
Distance_roads	498	226.32	100.000	0.0000	10000.0	0.0000	141.421	0.0000	500.0	738.7	33.100
Distance_roads_1	498	214.10	0.000	0.0000	10000.0	0.0000	0.000	0.0000	1000.0	806.4	36.135
Distance_roads_2	498	133.54	0.000	0.0000	11180.3	0.0000	0.000	0.0000	0.0	994.1	44.545
Distance_watercourses	494	3347.80	1345.362	0.0000	37009.5	447.2136	3301.515	141.4214	8043.0	5606.9	252.268
Distance_watercourses_1	494	3261.33	1414.214	0.0000	36769.6	0.0000	3162.278	0.0000	8246.2	5580.8	251.092
Distance_watercourses_2	494	2392.71	0.000	0.0000	33541.0	0.0000	0.000	0.0000	7071.1	5749.5	258.681
Population density	498	56308.27	598.710	3.0051	636764.2	214.0822	9513.052	125.4462	224373.7	135415.5	6068.114

Variable	IDPREC=5 Descriptive Statistics (*Ailanthus altissima*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	54	-0.05	-0.011	-0.7001	0.3	-0.149	0.058	-0.2072	0.10	0.2	0.02
Northness	54	0.02	-0.053	-0.9509	0.8	-0.358	0.517	-0.6291	0.76	0.5	0.07
Slope	54	6.26	5.281	0.1260	19.8	3.004	7.826	2.2659	13.35	4.5	0.61
Elevation	53	100.10	69.964	0.0000	353.6	17.596	148.386	0.8121	248.40	94.9	13.04
Bio_1	46	13.75	14.150	10.3000	16.2	13.000	14.900	10.9000	15.90	1.7	0.25
Bio_7	46	27.09	26.950	23.9000	31.0	25.600	27.500	24.9000	30.60	2.0	0.29
Bio_10	46	22.13	22.300	19.5000	24.3	21.200	23.100	20.4000	23.70	1.3	0.19
Bio_11	46	5.61	6.500	0.6000	8.9	5.200	7.100	1.0000	8.40	2.5	0.37
Bio_12	46	1013.54	938.000	674.0000	1385.0	879.000	1165.000	844.0000	1273.00	176.6	26.04
Bio_17	46	165.76	147.500	117.0000	266.0	137.000	192.000	131.0000	235.00	40.9	6.03
Bio_18	46	186.78	151.000	117.0000	303.0	138.000	235.000	133.0000	286.00	59.3	8.74
Distance_roads	54	97.29	100.000	0.0000	1081.7	0.000	141.421	0.0000	200.00	162.5	22.11
Distance_roads_1	54	111.11	0.000	0.0000	2000.0	0.000	0.000	0.0000	0.00	372.0	50.62
Distance_roads_2	54	0.00	0.000	0.0000	0.0	0.000	0.000	0.0000	0.00	0.0	0.00
Distance_watercourses	54	3907.31	2692.583	0.0000	19183.8	400.000	5578.530	141.4214	8840.81	4338.2	590.36
Distance_watercourses_1	54	3900.83	2828.427	0.0000	18973.7	1000.000	5385.165	0.0000	9219.54	4311.7	586.75
Distance_watercourses_2	54	3455.94	0.000	0.0000	18027.8	0.000	5000.000	0.0000	10000.00	4768.3	648.88
Population density	54	46347.15	738.925	3.0051	599885.3	208.762	3643.332	63.1144	32248.12	150396.2	20466.33

Variable	IDPREC=6 Descriptive Statistics (*Ailanthus altissima*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	63	-0.05	-0.030	-0.7442	0.2	-0.1185	0.061	-0.2569	0.13	0.16	0.02
Northness	63	-0.18	-0.280	-0.9417	0.8	-0.5208	0.107	-0.7363	0.49	0.46	0.06
Slope	63	8.85	7.749	0.0319	29.3	2.9213	13.599	1.0575	17.30	6.59	0.83
Elevation	61	178.02	128.006	0.0000	930.1	53.9295	242.059	8.3775	335.76	187.68	24.03
Bio_1	54	12.94	13.200	7.5000	15.9	11.7000	14.400	10.9000	15.00	1.75	0.24
Bio_7	54	26.97	26.950	24.1000	30.5	25.3000	27.900	24.8000	30.40	1.84	0.25
Bio_10	54	21.34	21.300	15.9000	23.8	20.3000	22.400	20.0000	23.20	1.52	0.21
Bio_11	54	4.73	5.400	-1.1000	8.5	3.2000	6.700	1.0000	7.40	2.35	0.32
Bio_12	54	1063.61	1019.500	812.0000	1367.0	924.0000	1218.000	882.0000	1310.00	163.86	22.30
Bio_17	54	183.83	180.000	123.0000	272.0	152.0000	220.000	140.0000	246.00	41.61	5.66
Bio_18	54	202.31	191.500	123.0000	282.0	152.0000	246.000	140.0000	281.00	52.10	7.09
Distance_roads	63	352.21	100.000	0.0000	10000.0	0.0000	200.000	0.0000	500.00	1280.28	161.30
Distance_roads_1	63	339.91	0.000	0.0000	10000.0	0.0000	0.000	0.0000	1000.00	1311.99	165.29
Distance_roads_2	63	336.20	0.000	0.0000	11180.3	0.0000	0.000	0.0000	0.00	1645.52	207.32
Distance_watercourses	63	3106.19	1360.147	0.0000	28602.8	412.3106	2662.705	282.8427	8246.21	5386.36	678.62
Distance_watercourses_1	63	3032.82	1414.214	0.0000	29000.0	0.0000	3000.000	0.0000	8246.21	5454.39	687.19
Distance_watercourses_2	63	2284.43	0.000	0.0000	30000.0	0.0000	0.000	0.0000	7071.07	5674.26	714.89
Population density	63	30972.03	329.887	9.9509	361416.0	108.4997	2285.608	22.9482	36740.13	91888.87	11576.91

Variable	IDPREC=7 Descriptive Statistics (*Ailanthus altissima*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	72	0.02	0.02	-0.2647	0.2	-0.032	0.08	-0.1385	0.1	0.1	0.01
Northness	72	-0.26	-0.24	-0.9603	0.9	-0.725	0.13	-0.8407	0.4	0.5	0.06
Slope	72	3.46	1.23	0.0076	26.0	0.670	3.89	0.2038	8.6	5.1	0.60
Elevation	71	106.95	100.62	0.1978	450.4	92.502	120.46	26.4683	152.0	67.0	7.95
Bio_1	69	11.72	10.80	9.8000	16.2	10.600	11.10	10.6000	15.2	1.9	0.23
Bio_7	69	29.68	30.50	23.7000	31.3	30.300	31.20	25.6000	31.3	2.3	0.27
Bio_10	69	20.72	20.10	18.9000	24.3	19.900	20.50	19.9000	23.2	1.4	0.16
Bio_11	69	2.28	0.90	0.2000	8.9	0.600	1.30	0.5000	7.6	2.9	0.35
Bio_12	69	955.42	924.00	640.0000	1326.0	922.000	935.00	859.0000	1163.0	110.7	13.33
Bio_17	69	158.78	162.00	123.0000	221.0	157.000	164.00	133.0000	166.0	15.8	1.90
Bio_18	69	245.96	270.00	127.0000	286.0	264.000	281.00	133.0000	282.0	54.5	6.57
Distance_roads	72	241.56	100.00	0.0000	4808.3	0.000	100.00	0.0000	223.6	789.9	93.09
Distance_roads_1	72	216.84	0.00	0.0000	5099.0	0.000	0.00	0.0000	0.0	877.1	103.36
Distance_roads_2	72	196.42	0.00	0.0000	7071.1	0.000	0.00	0.0000	0.0	1170.2	137.91
Distance_watercourses	71	3538.76	1100.00	0.0000	33295.2	447.214	2319.48	316.2278	9406.9	7113.3	844.19
Distance_watercourses_1	71	3551.29	1000.00	0.0000	33241.5	1000.000	2828.43	0.0000	9219.5	7103.9	843.08
Distance_watercourses_2	71	2687.29	0.00	0.0000	33541.0	0.000	0.00	0.0000	10000.0	7570.9	898.50
Population density	72	95755.18	15197.36	66.5691	545662.9	2087.693	61945.40	164.2144	396953.3	158523.9	18682.22

Variable	IDPREC=11 Descriptive Statistics (*Ailanthus altissima*)									
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	92	-0.011	-0.0084	-0.2831	0.26	-0.0884	0.053	-0.1299	0.110	0.104	0.0108
Northness	92	-0.184	-0.2015	-0.9853	0.86	-0.6134	0.145	-0.8326	0.510	0.482	0.0503
Slope	92	1.390	0.2522	0.0000	13.16	0.0000	1.172	0.0000	5.545	2.572	0.2681
Elevation	91	110.542	105.1281	71.1453	262.15	88.6940	115.734	82.6750	136.332	32.929	3.4519
Bio_1	92	10.843	10.8000	9.7000	11.30	10.6000	11.200	10.5000	11.200	0.347	0.0362
Bio_7	92	30.721	30.6000	29.8000	32.00	30.4000	30.800	30.3000	31.700	0.510	0.0532
Bio_10	92	20.083	20.1000	19.0000	20.80	19.8000	20.200	19.7000	20.700	0.384	0.0400
Bio_11	92	0.934	0.9000	-0.1000	1.90	0.6000	1.150	0.6000	1.600	0.408	0.0426
Bio_12	92	868.250	917.0000	647.0000	1032.00	787.0000	933.500	678.0000	967.000	106.483	11.1016
Bio_17	92	155.011	158.0000	120.0000	205.00	135.0000	162.000	134.0000	180.000	19.313	2.0135
Bio_18	92	259.196	272.0000	197.0000	319.00	249.0000	279.000	197.0000	285.000	31.879	3.3236
Distance_roads	94	600.367	316.2278	0.0000	4900.00	0.0000	860.233	0.0000	1345.362	806.817	83.2168
Distance_roads_1	94	480.789	0.0000	0.0000	5000.00	0.0000	1000.000	0.0000	1000.000	824.824	85.0741
Distance_roads_2	94	106.383	0.0000	0.0000	5000.00	0.0000	0.000	0.0000	0.000	725.393	74.8186
Distance_watercourses	94	732.795	338.3914	0.0000	5060.63	100.0000	1303.840	0.0000	1749.286	809.308	83.4737
Distance_watercourses_1	94	684.944	500.0000	0.0000	5000.00	0.0000	1000.000	0.0000	1414.214	841.785	86.8235
Distance_watercourses_2	94	159.574	0.0000	0.0000	5000.00	0.0000	0.000	0.0000	0.000	883.580	91.1343
Population density	94	1556.983	677.0697	29.6879	60828.14	258.0493	1300.283	131.1842	1703.085	6264.238	646.1068

Variable	All Groups Descriptive Statistics (*Ambrosia artemisiifolia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	1044	0.00	0.0034	-0.8177	0.3	-0.0611	0.073	-0.1205	0.11	0.11	0.003
Northness	1044	-0.12	-0.2043	-0.9618	1.0	-0.5742	0.297	-0.8160	0.66	0.53	0.017
Slope	1044	2.36	0.8595	0.0000	22.8	0.0674	2.922	0.0000	6.88	3.74	0.116
Elevation	1040	173.15	142.3094	0.0000	843.2	105.1973	193.302	87.7787	308.95	126.85	3.933
Bio_1	1037	10.76	10.7000	7.3000	16.4	10.2000	11.100	9.9000	11.20	1.14	0.036
Bio_7	1037	30.14	30.4000	23.4000	32.0	30.2000	30.600	28.8000	31.10	1.09	0.034
Bio_10	1037	19.91	20.0000	15.9000	24.3	19.4000	20.300	19.1000	20.50	1.03	0.032
Bio_11	1019	1.09	0.8000	-1.8000	9.2	0.4000	1.200	0.1000	1.60	1.54	0.048
Bio_12	1037	937.46	922.0000	630.0000	1390.0	883.0000	1006.000	778.0000	1083.00	127.78	3.968
Bio_17	1037	163.35	158.0000	107.0000	286.0	143.0000	177.000	133.0000	198.00	30.49	0.947
Bio_18	1037	270.17	280.0000	107.0000	343.0	270.0000	292.000	219.0000	304.00	39.23	1.218
Distance_roads	922	8899.06	100.0000	0.0000	322539.0	0.0000	400.000	0.0000	989.95	50341.13	1657.897
Distance_roads_1	922	180.18	0.0000	0.0000	2828.4	0.0000	0.000	0.0000	1000.00	421.26	13.873
Distance_roads_2	922	36.18	0.0000	0.0000	5000.0	0.0000	0.000	0.0000	0.00	402.42	13.253
Distance_watercourses	922	994.92	538.5165	0.0000	44148.0	200.0000	1000.000	100.0000	1664.33	2488.56	81.956
Distance_watercourses_1	922	879.37	101.5000	0.0000	43657.8	0.0000	1000.000	0.0000	1414.21	2488.27	81.947
Distance_watercourses_2	898	343.06	0.0000	0.0000	42720.0	0.0000	0.000	0.0000	0.00	2394.81	79.916
Population density	898	16242.75	979.3611	4.2729	599885.3	295.6058	3080.838	123.4144	15105.13	59467.78	1984.466

Variable	IDPREC=5 Descriptive Statistics (*Ambrosia artemisiifolia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	128	-0.01	0.016	-0.7001	0.3	-0.0724	0.081	-0.1802	0.12	0.13	0.012
Northness	128	0.01	0.075	-0.9290	0.9	-0.4579	0.425	-0.7542	0.84	0.55	0.049
Slope	128	1.83	0.953	0.0000	19.8	0.1797	2.892	0.0000	4.62	2.48	0.219
Elevation	128	107.10	105.027	0.0000	418.4	86.5964	129.604	17.5960	171.29	56.27	4.973
Bio_1	126	11.64	11.100	10.1000	16.4	10.8000	11.300	10.6000	14.90	1.59	0.141
Bio_7	126	29.88	30.500	23.4000	31.8	30.0000	30.800	27.4000	31.00	1.68	0.150
Bio_10	126	20.68	20.300	19.3000	24.3	20.1000	20.600	19.8000	23.10	1.19	0.106
Bio_11	126	2.11	1.000	0.2000	9.2	0.9000	1.600	0.6000	7.00	2.45	0.218
Bio_12	126	849.51	874.000	630.0000	1390.0	725.0000	934.000	674.0000	1044.00	140.47	12.514
Bio_17	126	150.27	141.000	107.0000	272.0	131.0000	163.000	124.0000	191.00	26.34	2.346
Bio_18	126	229.94	231.000	107.0000	295.0	201.0000	277.000	137.0000	284.00	52.93	4.716
Distance_roads	128	59.21	0.000	0.0000	400.0	0.0000	100.000	0.0000	200.00	87.90	7.769
Distance_roads_1	128	70.31	0.000	0.0000	1000.0	0.0000	0.000	0.0000	0.00	256.68	22.687
Distance_roads_2	128	0.00	0.000	0.0000	0.0	0.0000	0.000	0.0000	0.00	0.00	0.000
Distance_watercourses	128	1851.47	400.000	0.0000	44148.0	211.8034	1111.285	100.0000	4441.85	4619.32	408.294
Distance_watercourses_1	128	1724.91	0.000	0.0000	43657.8	0.0000	1414.214	0.0000	5000.00	4600.72	406.650
Distance_watercourses_2	128	1260.37	0.000	0.0000	42720.0	0.0000	0.000	0.0000	5000.00	4543.46	401.589
Population density	128	15151.33	1024.315	73.0376	476323.5	512.7577	7469.310	236.4384	28332.05	60542.95	5351.291

Variable	IDPREC=6 Descriptive Statistics (*Ambrosia artemisiifolia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	14	-0.133	-0.088	-0.6668	0.12	-0.1185	-0.073	-0.3192	0.025	0.184	0.049
Northness	14	-0.038	-0.032	-0.8931	0.62	-0.3635	0.416	-0.6166	0.574	0.470	0.126
Slope	14	3.784	3.436	0.0000	14.47	0.3693	6.203	0.0867	7.727	4.044	1.081
Elevation	14	198.160	105.249	0.0009	713.83	3.2222	408.319	1.5768	444.302	223.716	59.791
Bio_1	12	12.175	11.750	8.3000	15.40	10.4500	14.850	9.9000	15.400	2.442	0.705
Bio_7	12	28.367	27.750	27.2000	30.80	27.3500	29.350	27.3000	30.600	1.368	0.395
Bio_10	12	20.742	20.450	16.9000	23.60	19.2000	23.100	18.5000	23.500	2.206	0.637
Bio_11	12	3.508	2.850	-0.8000	7.60	1.0000	7.000	0.6000	7.600	3.096	0.894
Bio_12	12	1015.917	983.000	850.0000	1320.00	878.5000	1117.500	853.0000	1289.000	168.914	48.761
Bio_17	12	187.083	183.000	132.0000	271.00	138.5000	225.000	132.0000	269.000	52.083	15.035
Bio_18	12	208.083	218.500	132.0000	273.00	138.5000	266.500	132.0000	273.000	62.092	17.924
Distance_roads	14	287.653	182.514	100.0000	721.11	100.0000	447.214	100.0000	707.107	228.974	61.196
Distance_roads_1	14	142.857	0.000	0.0000	1000.00	0.0000	0.000	0.0000	1000.000	363.137	97.052
Distance_roads_2	14	0.000	0.000	0.0000	0.00	0.0000	0.000	0.0000	0.000	0.000	0.000
Distance_watercourses	14	3047.404	840.312	0.0000	14425.33	200.0000	6456.005	0.0000	8115.417	4454.700	1190.569
Distance_watercourses_1	14	3094.073	1000.000	0.0000	14317.82	0.0000	6082.763	0.0000	8544.004	4480.505	1197.465
Distance_watercourses_2	14	2644.614	0.000	0.0000	15811.39	0.0000	7071.068	0.0000	7071.068	4820.503	1288.334
Population density	14	1989.479	327.353	21.4177	7802.50	93.9941	2415.394	63.5939	7802.500	3153.569	842.827

Variable	IDPREC=7 Descriptive Statistics (*Ambrosia artemisiifolia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	154	0.0	0.0	-0.23	0.2	-0.06	0.1	-0.11	0.1	0.1	0.01
Northness	154	-0.2	-0.2	-0.96	0.9	-0.65	0.2	-0.78	0.5	0.5	0.04
Slope	154	1.1	0.4	0.00	12.6	0.00	1.0	0.00	3.2	1.9	0.16
Elevation	154	132.0	99.2	15.47	753.2	92.15	124.6	86.59	254.0	90.8	7.32
Bio_1	154	10.8	10.7	7.80	14.6	10.60	11.0	10.50	11.1	0.8	0.06
Bio_7	154	30.7	30.9	27.10	31.3	30.50	31.2	30.10	31.3	0.9	0.08
Bio_10	154	20.0	19.9	16.40	22.7	19.90	20.1	19.70	20.5	0.7	0.06
Bio_11	153	0.9	0.6	-1.20	7.0	0.60	1.1	0.50	1.2	1.1	0.09
Bio_12	154	903.0	922.0	745.00	1322.0	883.00	927.0	780.00	955.0	77.9	6.28
Bio_17	154	160.2	162.0	125.00	273.0	155.00	165.0	148.00	166.0	15.7	1.27
Bio_18	154	261.8	270.0	142.00	296.0	269.00	273.0	230.00	283.0	27.9	2.24
Distance_roads	32	249416.6	322539.0	15272.00	322539.0	96533.00	322539.0	68200.00	322539.0	115866.2	20482.44
Distance_roads_1	32	107.5	109.0	101.00	109.0	106.50	109.0	103.00	109.0	2.6	0.46
Distance_roads_2	32	105.1	106.0	101.00	106.0	104.50	106.0	102.00	106.0	1.6	0.29
Distance_watercourses	32	105.1	106.0	101.00	106.0	104.50	106.0	102.00	106.0	1.6	0.29
Distance_watercourses_1	32	102.2	102.0	101.00	105.0	102.00	102.0	102.00	103.0	0.7	0.12
Distance_watercourses_2	8	103.4	103.5	101.00	106.0	102.00	104.5	101.00	106.0	1.7	0.60
Population density	8	103.4	103.5	101.00	106.0	102.00	104.5	101.00	106.0	1.7	0.60

Variable	IDPREC=11 Descriptive Statistics (*Ambrosia artemisiifolia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	748	0.00	0.0035	-0.8177	0.3	-0.0545	0.073	-0.1123	0.12	0.11	0.004
Northness	748	-0.14	-0.2368	-0.9618	1.0	-0.5742	0.293	-0.8228	0.68	0.54	0.020
Slope	748	2.69	0.9543	0.0000	22.8	0.0771	3.418	0.0000	8.64	4.11	0.150
Elevation	744	192.56	148.6870	0.0000	843.2	112.1125	213.631	104.0498	343.15	133.77	4.904
Bio_1	745	10.59	10.7000	7.3000	16.0	10.1000	11.100	9.8000	11.10	1.00	0.037
Bio_7	745	30.10	30.3000	23.4000	32.0	30.1000	30.500	29.1000	30.60	0.91	0.033
Bio_10	745	19.75	19.9000	15.9000	24.3	19.3000	20.300	19.0000	20.50	0.96	0.035
Bio_11	728	0.91	0.8000	-1.8000	8.1	0.3000	1.300	0.1000	1.50	1.25	0.046
Bio_12	745	958.20	924.0000	641.0000	1380.0	913.0000	1007.000	791.0000	1108.00	125.16	4.585
Bio_17	745	165.82	158.0000	113.0000	286.0	143.0000	178.000	135.0000	202.00	32.27	1.182
Bio_18	745	279.69	284.0000	113.0000	343.0	277.0000	296.000	251.0000	305.00	31.85	1.167
Distance_roads	748	283.42	100.0000	0.0000	2720.3	0.0000	400.000	0.0000	921.95	414.44	15.153
Distance_roads_1	748	202.79	0.0000	0.0000	2828.4	0.0000	0.000	0.0000	1000.00	449.96	16.452
Distance_roads_2	748	40.11	0.0000	0.0000	5000.0	0.0000	0.000	0.0000	0.00	446.31	16.319
Distance_watercourses	748	848.00	600.0000	0.0000	42675.5	223.6068	1000.000	100.0000	1600.00	1844.49	67.441
Distance_watercourses_1	748	726.47	0.0000	0.0000	42047.6	0.0000	1000.000	0.0000	1414.21	1849.87	67.638
Distance_watercourses_2	748	145.58	0.0000	0.0000	38078.9	0.0000	0.000	0.0000	0.00	1640.01	59.965
Population density	748	16868.91	999.2467	4.2729	599885.3	293.5121	2707.815	127.5459	13889.75	60133.18	2198.687

Variable	All Groups Descriptive Statistics (*Echinocystis lobata*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	178	0.003	-0.0023	-0.2831	0.30	-0.0652	0.074	-0.1299	0.13	0.10	0.0077
Northness	178	-0.082	-0.0962	-0.9853	0.93	-0.4789	0.292	-0.7542	0.51	0.48	0.0360
Slope	178	1.587	0.4217	0.0000	26.97	0.0319	1.145	0.0000	5.65	3.22	0.2412
Elevation	177	117.533	103.0282	68.6091	462.61	91.3384	118.649	84.0429	168.96	52.55	3.9496
Bio_1	178	10.791	10.8000	9.2000	11.30	10.6000	11.100	10.3000	11.20	0.37	0.0276
Bio_7	178	30.721	30.7000	27.0000	32.00	30.4000	31.000	30.3000	31.30	0.60	0.0448
Bio_10	178	20.015	20.0000	18.4000	20.80	19.8000	20.200	19.6000	20.50	0.42	0.0313
Bio_11	178	0.892	0.9000	-0.5000	2.70	0.6000	1.100	0.4000	1.50	0.43	0.0322
Bio_12	178	880.348	920.0000	630.0000	1368.00	820.0000	932.000	679.0000	972.00	108.53	8.1344
Bio_17	178	156.989	158.0000	120.0000	285.00	148.0000	164.000	131.0000	175.00	21.66	1.6236
Bio_18	178	262.365	270.0000	192.0000	329.00	255.0000	279.000	198.0000	285.00	28.80	2.1590
Distance_roads	180	447.131	200.0000	0.0000	4900.00	0.0000	700.000	0.0000	1104.20	636.34	47.4303
Distance_roads_1	180	328.857	0.0000	0.0000	5000.00	0.0000	1000.000	0.0000	1000.00	666.57	49.6835
Distance_roads_2	180	111.111	0.0000	0.0000	5000.00	0.0000	0.000	0.0000	0.00	739.08	55.0880
Distance_watercourses	180	673.326	418.2873	0.0000	5060.63	100.0000	1166.190	0.0000	1716.09	695.29	51.8239
Distance_watercourses_1	180	620.152	0.0000	0.0000	5000.00	0.0000	1000.000	0.0000	1414.21	775.94	57.8355
Distance_watercourses_2	180	111.111	0.0000	0.0000	5000.00	0.0000	0.000	0.0000	0.00	739.08	55.0880
Population density	180	5079.934	915.1754	11.2616	94930.27	295.2904	2292.692	172.2251	13001.85	13189.02	983.0517

Variable	IDPREC=5 Descriptive Statistics (*Echinocystis lobata*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	33	-0.004	-0.0047	-0.1999	0.18	-0.0652	0.069	-0.1310	0.119	0.094	0.0164
Northness	33	-0.029	-0.0492	-0.8935	0.93	-0.4789	0.332	-0.6744	0.463	0.508	0.0883
Slope	33	1.848	0.5510	0.0000	9.18	0.0875	3.316	0.0000	6.168	2.653	0.4618
Elevation	33	140.964	118.6494	86.1752	400.25	95.7574	172.970	92.8366	194.833	68.344	11.8971
Bio_1	33	10.636	10.7000	9.2000	11.30	10.4000	11.000	10.1000	11.100	0.483	0.0840
Bio_7	33	30.664	30.6000	29.8000	31.90	30.5000	30.800	30.2000	31.100	0.379	0.0660
Bio_10	33	19.845	19.9000	18.4000	20.80	19.6000	20.200	19.3000	20.500	0.547	0.0952
Bio_11	33	0.752	0.8000	-0.5000	1.70	0.6000	1.000	0.2000	1.300	0.447	0.0779
Bio_12	33	848.727	846.0000	630.0000	1006.00	794.0000	921.000	684.0000	957.000	101.911	17.7404
Bio_17	33	148.030	151.0000	120.0000	184.00	130.0000	160.000	124.0000	172.000	17.882	3.1129
Bio_18	33	262.545	275.0000	192.0000	329.00	254.0000	283.000	201.0000	291.000	33.026	5.7490
Distance_roads	33	122.321	0.0000	0.0000	921.95	0.0000	141.421	0.0000	360.555	224.739	39.1220
Distance_roads_1	33	60.606	0.0000	0.0000	1000.00	0.0000	0.000	0.0000	0.000	242.306	42.1800
Distance_roads_2	33	0.000	0.0000	0.0000	0.00	0.0000	0.000	0.0000	0.000	0.000	0.0000
Distance_watercourses	33	373.245	282.8427	0.0000	1486.61	100.0000	632.456	0.0000	900.000	369.658	64.3493
Distance_watercourses_1	33	303.030	0.0000	0.0000	1000.00	0.0000	1000.000	0.0000	1000.000	466.694	81.2409
Distance_watercourses_2	33	0.000	0.0000	0.0000	0.00	0.0000	0.000	0.0000	0.000	0.000	0.0000
Population density	33	2038.800	767.4008	58.1673	13380.14	263.2810	1959.685	158.2417	6071.115	3203.072	557.5833

Variable	IDPREC=6 Descriptive Statistics (*Echinocystis lobata*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	13	0.06	0.038	-0.0700	0.23	0.027	0.13	0.0205	0.13	0.07	0.021
Northness	13	0.30	0.352	-0.1511	0.88	-0.006	0.37	-0.1511	0.88	0.38	0.105
Slope	13	3.90	0.941	0.1201	26.97	0.204	1.12	0.1201	14.55	7.95	2.204
Elevation	13	152.89	113.192	68.6091	462.61	112.512	115.82	86.1691	349.45	115.53	32.043
Bio_1	13	11.03	11.100	10.1000	11.20	11.100	11.10	11.0000	11.20	0.29	0.080
Bio_7	13	29.94	30.400	27.0000	30.60	30.400	30.50	27.2000	30.60	1.26	0.350
Bio_10	13	20.25	20.500	18.7000	20.50	20.200	20.50	19.8000	20.50	0.51	0.141
Bio_11	13	1.41	1.300	1.1000	2.70	1.200	1.50	1.1000	1.60	0.42	0.117
Bio_12	13	1012.38	947.000	931.0000	1368.00	939.000	972.00	933.0000	1360.00	156.76	43.476
Bio_17	13	184.69	169.000	161.0000	285.00	164.000	174.00	161.0000	280.00	43.70	12.121
Bio_18	13	282.31	280.000	269.0000	304.00	279.000	284.00	271.0000	296.00	9.20	2.550
Distance_roads	13	356.93	360.555	141.4214	707.11	200.000	500.00	200.0000	700.00	194.47	53.935
Distance_roads_1	13	307.69	0.000	0.0000	1000.00	0.000	1000.00	0.0000	1000.00	480.38	133.235
Distance_roads_2	13	0.00	0.000	0.0000	0.00	0.000	0.00	0.0000	0.00	0.00	0.000
Distance_watercourses	13	1056.08	781.025	360.5551	1772.00	670.820	1726.27	412.3106	1726.27	532.38	147.656
Distance_watercourses_1	13	1185.71	1000.000	0.0000	2000.00	1000.000	2000.00	0.0000	2000.00	802.25	222.504
Distance_watercourses_2	13	384.62	0.000	0.0000	5000.00	0.000	0.00	0.0000	0.00	1386.75	384.615
Population density	13	25187.41	1984.328	11.2616	69463.17	360.740	45358.07	31.7409	69463.17	28412.65	7880.252

Variable	IDPREC=7 Descriptive Statistics (*Echinocystis lobata*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	40	0.021	0.020	-0.1719	0.30	-0.0577	0.08	-0.1223	0.16	0.11	0.017
Northness	40	-0.015	0.119	-0.7456	0.71	-0.3201	0.28	-0.7059	0.47	0.41	0.065
Slope	40	1.074	0.749	0.0000	12.61	0.2999	0.90	0.0000	1.99	2.04	0.323
Elevation	40	102.613	93.256	83.5751	241.04	90.9764	101.10	85.2836	128.01	28.19	4.457
Bio_1	40	10.720	10.700	9.7000	11.20	10.6000	10.95	10.5500	11.00	0.26	0.041
Bio_7	40	31.025	31.200	30.2000	31.30	30.9000	31.20	30.4500	31.30	0.32	0.050
Bio_10	40	19.923	19.900	18.8000	20.40	19.9000	20.10	19.7000	20.10	0.25	0.040
Bio_11	40	0.745	0.600	0.1000	1.60	0.6000	1.10	0.5000	1.10	0.31	0.049
Bio_12	40	891.350	923.000	778.0000	1010.00	870.5000	925.00	780.0000	927.00	61.55	9.732
Bio_17	40	159.925	164.000	135.0000	176.00	155.5000	164.50	148.0000	165.50	8.20	1.297
Bio_18	40	263.025	270.000	230.0000	293.00	263.5000	270.00	230.0000	275.00	17.79	2.813
Distance_roads	40	384.312	321.699	0.0000	1204.16	100.0000	600.00	100.0000	744.07	317.13	50.142
Distance_roads_1	40	200.000	0.000	0.0000	1000.00	0.0000	0.00	0.0000	1000.00	405.10	64.051
Distance_roads_2	40	250.000	0.000	0.0000	5000.00	0.0000	0.00	0.0000	0.00	1103.61	174.496
Distance_watercourses	40	656.745	462.132	0.0000	2720.29	258.1139	1059.90	100.0000	1303.86	569.02	89.970
Distance_watercourses_1	40	545.711	0.000	0.0000	3000.00	0.0000	1000.00	0.0000	1207.11	699.60	110.616
Distance_watercourses_2	40	0.000	0.000	0.0000	0.00	0.0000	0.00	0.0000	0.00	0.00	0.000
Population density	40	9332.877	4278.765	273.9475	94930.27	753.3821	13001.85	482.9955	23186.58	16029.36	2534.465

Variable	IDPREC=11 Descriptive Statistics (*Echinocystis lobata*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	92	-0.011	-0.0084	-0.2831	0.26	-0.0884	0.053	-0.1299	0.110	0.104	0.0108
Northness	92	-0.184	-0.2015	-0.9853	0.86	-0.6134	0.145	-0.8326	0.510	0.482	0.0503
Slope	92	1.390	0.2522	0.0000	13.16	0.0000	1.172	0.0000	5.545	2.572	0.2681
Elevation	91	110.542	105.1281	71.1453	262.15	88.6940	115.734	82.6750	136.332	32.929	3.4519
Bio_1	92	10.843	10.8000	9.7000	11.30	10.6000	11.200	10.5000	11.200	0.347	0.0362
Bio_7	92	30.721	30.6000	29.8000	32.00	30.4000	30.800	30.3000	31.700	0.510	0.0532
Bio_10	92	20.083	20.1000	19.0000	20.80	19.8000	20.200	19.7000	20.700	0.384	0.0400
Bio_11	92	0.934	0.9000	-0.1000	1.90	0.6000	1.150	0.6000	1.600	0.408	0.0426
Bio_12	92	868.250	917.0000	647.0000	1032.00	787.0000	933.500	678.0000	967.000	106.483	11.1016
Bio_17	92	155.011	158.0000	120.0000	205.00	135.0000	162.000	134.0000	180.000	19.313	2.0135
Bio_18	92	259.196	272.0000	197.0000	319.00	249.0000	279.000	197.0000	285.000	31.879	3.3236
Distance_roads	94	600.367	316.2278	0.0000	4900.00	0.0000	860.233	0.0000	1345.362	806.817	83.2168
Distance_roads_1	94	480.789	0.0000	0.0000	5000.00	0.0000	1000.000	0.0000	1000.000	824.824	85.0741
Distance_roads_2	94	106.383	0.0000	0.0000	5000.00	0.0000	0.000	0.0000	0.000	725.393	74.8186
Distance_watercourses	94	732.795	338.3914	0.0000	5060.63	100.0000	1303.840	0.0000	1749.286	809.308	83.4737
Distance_watercourses_1	94	684.944	500.0000	0.0000	5000.00	0.0000	1000.000	0.0000	1414.214	841.785	86.8235
Distance_watercourses_2	94	159.574	0.0000	0.0000	5000.00	0.0000	0.000	0.0000	0.000	883.580	91.1343
Population density	94	1556.983	677.0697	29.6879	60828.14	258.0493	1300.283	131.1842	1703.085	6264.238	646.1068

Variable	All Groups Descriptive Statistics (*Erigeron annuus*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	1433	229.46	0.0000	0.0000	15811.4	0.0000	0.000	0.0000	0.00	1203.62	31.796
Northness	1432	0.00	0.0006	-0.7001	0.4	-0.0619	0.074	-0.1228	0.13	0.10	0.003
Slope	1432	-0.08	-0.0857	-0.9853	1.0	-0.5035	0.312	-0.7440	0.63	0.50	0.013
Elevation	1432	4.44	2.7999	0.0000	34.1	0.1938	7.305	0.0000	11.20	5.00	0.132
Bio_1	1431	271.54	160.6696	0.0000	1433.3	105.7186	343.152	90.6489	692.15	235.33	6.221
Bio_7	1428	10.43	10.6000	4.8000	16.5	9.7000	11.000	8.2000	11.70	1.64	0.043
Bio_10	1428	29.52	30.3000	23.8000	31.9	28.0000	30.500	27.1000	30.90	1.63	0.043
Bio_11	1428	19.44	19.8000	13.0000	24.4	18.8000	20.300	16.8000	20.70	1.65	0.044
Bio_12	1415	0.94	0.7000	-3.6000	9.3	0.1000	1.100	-1.0000	3.30	1.92	0.051
Bio_17	1428	988.93	934.0000	630.0000	1390.0	906.5000	1058.500	778.0000	1303.00	183.28	4.850
Bio_18	1428	178.80	158.0000	117.0000	290.0	150.0000	192.000	134.0000	267.00	48.27	1.277
Distance_roads	1428	265.41	276.0000	117.0000	363.0	260.0000	285.000	198.0000	310.00	42.12	1.115
Distance_roads_1	1435	331.16	100.0000	0.0000	4535.4	0.0000	412.311	0.0000	921.95	517.92	13.672
Distance_roads_2	1435	235.40	0.0000	0.0000	5000.0	0.0000	0.000	0.0000	1000.00	529.13	13.968
Distance_watercourses	1435	38.33	0.0000	0.0000	5000.0	0.0000	0.000	0.0000	0.00	436.24	11.516
Distance_watercourses_1	1433	824.89	424.2641	0.0000	14230.2	141.4214	1000.000	100.0000	1972.31	1190.92	31.460
Distance_watercourses_2	1435	720.96	0.0000	0.0000	14422.2	0.0000	1000.000	0.0000	2000.00	1214.19	32.053
Population density	1435	26291.01	366.3397	1.6391	643274.3	161.1453	1304.465	69.5377	27421.46	89771.71	2369.810

Variable	IDPREC=5 Descriptive Statistics (*Erigeron annuus*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	149	625.54	0.0000	0.0000	15811.4	0.0000	0.000	0.0000	0.00	2161.86	177.106
Northness	147	-0.01	-0.0070	-0.7001	0.3	-0.0652	0.077	-0.1486	0.13	0.13	0.011
Slope	147	-0.07	-0.1353	-0.9271	0.9	-0.5323	0.356	-0.8062	0.79	0.56	0.046
Elevation	147	3.02	1.8893	0.0000	18.7	0.2823	4.617	0.0000	7.46	3.52	0.290
Bio_1	147	162.33	120.7739	0.0000	834.0	99.3902	183.933	85.3095	279.67	141.79	11.694
Bio_7	144	11.20	11.0000	8.0000	16.2	10.5000	11.200	10.1000	14.10	1.59	0.133
Bio_10	144	29.75	30.4000	24.2000	31.8	29.7000	30.700	26.6000	30.90	1.66	0.138
Bio_11	144	20.25	20.2000	16.6000	24.3	19.7000	20.500	19.3000	22.40	1.34	0.112
Bio_12	141	1.70	0.9000	-1.0000	8.9	0.6000	1.600	0.4000	6.10	2.23	0.188
Bio_17	144	912.86	910.5000	630.0000	1390.0	788.0000	1001.000	675.0000	1117.00	174.73	14.561
Bio_18	144	160.90	153.0000	117.0000	289.0	134.0000	168.500	125.0000	213.00	36.78	3.065
Distance_roads	144	247.39	270.5000	117.0000	334.0	204.0000	280.000	151.0000	293.00	51.78	4.315
Distance_roads_1	149	119.10	0.0000	0.0000	4001.2	0.0000	100.000	0.0000	141.42	473.32	38.776
Distance_roads_2	149	147.65	0.0000	0.0000	4000.0	0.0000	0.000	0.0000	1000.00	537.46	44.030
Distance_watercourses	149	67.11	0.0000	0.0000	5000.0	0.0000	0.000	0.0000	0.00	577.32	47.296
Distance_watercourses_1	149	1034.69	360.5551	0.0000	14230.2	141.4214	894.427	100.0000	2780.29	1957.82	160.391
Distance_watercourses_2	149	940.81	0.0000	0.0000	14422.2	0.0000	1000.000	0.0000	3162.28	1957.52	160.366
Population density	149	13516.79	698.2847	4.3993	476323.5	236.4384	2903.735	129.6935	28332.05	58285.81	4774.959

Variable	IDPREC=6 Descriptive Statistics (*Erigeron annuus*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	121	422.98	0.000	0.0000	11180.3	0.0000	0.000	0.0000	0.00	1589.9	144.54
Northness	121	0.01	-0.016	-0.1753	0.3	-0.0641	0.079	-0.1122	0.15	0.1	0.01
Slope	121	-0.06	-0.031	-0.9348	0.9	-0.4793	0.352	-0.7747	0.67	0.5	0.05
Elevation	121	6.16	5.168	0.0000	32.7	0.7883	9.229	0.0000	14.23	6.1	0.55
Bio_1	121	385.29	224.332	4.1219	1433.3	103.4889	698.331	85.2038	861.71	332.8	30.25
Bio_7	120	10.04	10.600	4.8000	15.3	8.3000	11.100	7.6000	12.00	2.0	0.18
Bio_10	120	28.98	28.950	24.7000	31.2	27.6000	30.450	27.2500	30.70	1.7	0.16
Bio_11	120	18.94	19.900	13.0000	23.5	16.9000	20.400	16.2000	20.60	2.1	0.19
Bio_12	118	0.77	0.900	-3.2000	8.0	-0.8000	1.300	-1.4000	3.90	2.0	0.19
Bio_17	120	1056.17	981.000	640.0000	1333.0	921.5000	1285.500	734.5000	1316.00	212.2	19.37
Bio_18	120	200.52	176.500	123.0000	285.0	162.0000	263.000	132.0000	273.00	53.8	4.91
Distance_roads	120	253.85	271.000	132.0000	301.0	231.0000	281.000	188.0000	289.00	41.4	3.78
Distance_roads_1	121	598.99	360.555	0.0000	4272.0	100.0000	806.226	0.0000	1253.00	831.4	75.58
Distance_roads_2	121	411.14	0.000	0.0000	4123.1	0.0000	1000.000	0.0000	1000.00	803.9	73.08
Distance_watercourses	121	41.32	0.000	0.0000	5000.0	0.0000	0.000	0.0000	0.00	454.5	41.32
Distance_watercourses_1	121	1094.19	583.095	0.0000	9534.1	282.8427	1360.147	100.0000	2507.99	1439.3	130.85
Distance_watercourses_2	121	1011.09	1000.000	0.0000	9848.9	0.0000	1414.214	0.0000	2236.07	1467.1	133.38
Population density	121	38981.73	202.423	11.3504	643274.3	90.7293	1449.666	39.7143	95659.98	117818.6	10710.78

Variable	IDPREC=7 Descriptive Statistics (*Erigeron annuus*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	243	46.01	0.000	0.0000	11180.3	0.0000	0.00	0.0000	0.0	717.2	46.010
Northness	243	0.01	0.022	-0.2336	0.2	-0.0498	0.08	-0.1094	0.1	0.1	0.006
Slope	243	-0.17	-0.181	-0.9603	0.9	-0.6285	0.21	-0.8390	0.5	0.5	0.032
Elevation	243	2.37	0.882	0.0000	20.5	0.1551	3.34	0.0000	6.7	3.4	0.219
Bio_1	243	166.33	120.207	27.7503	856.9	97.5291	171.06	88.0857	287.1	136.8	8.774
Bio_7	242	10.70	10.700	6.6000	16.2	10.6000	11.00	10.1000	11.1	1.0	0.065
Bio_10	242	30.37	30.500	24.2000	31.5	30.3000	31.20	29.5000	31.3	1.3	0.082
Bio_11	242	19.86	19.900	15.1000	24.2	19.8000	20.30	19.0000	20.5	1.0	0.064
Bio_12	240	0.94	0.700	-2.2000	8.6	0.6000	1.10	0.4000	1.3	1.3	0.083
Bio_17	242	927.17	923.000	724.0000	1363.0	882.0000	940.00	789.0000	975.0	109.6	7.045
Bio_18	242	164.63	162.000	132.0000	280.0	155.0000	164.00	148.0000	167.0	25.0	1.607
Distance_roads	242	268.14	270.000	139.0000	345.0	268.0000	282.00	230.0000	286.0	26.2	1.682
Distance_roads_1	243	259.20	100.000	0.0000	4535.4	0.0000	316.23	0.0000	600.0	455.3	29.210
Distance_roads_2	243	115.23	0.000	0.0000	5000.0	0.0000	0.00	0.0000	0.0	458.0	29.384
Distance_watercourses	243	164.61	0.000	0.0000	5000.0	0.0000	0.00	0.0000	0.0	894.0	57.350
Distance_watercourses_1	243	702.10	424.264	0.0000	10707.9	200.0000	943.40	100.0000	1565.2	924.1	59.283
Distance_watercourses_2	243	590.29	0.000	0.0000	10049.9	0.0000	1000.00	0.0000	1414.2	979.8	62.855
Population density	243	58562.69	3140.873	6.3373	565444.5	450.4249	23575.83	122.8055	266818.2	122490.2	7857.747

Variable	IDPREC=11 Descriptive Statistics (*Erigeron annuus*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	920	188.32	0.0000	0.0000	11180.3	0.0000	0.000	0.0000	0.000	999.11	32.940
Northness	921	0.00	-0.0028	-0.4205	0.4	-0.0607	0.073	-0.1275	0.135	0.10	0.003
Slope	921	-0.06	-0.0646	-0.9853	1.0	-0.4518	0.326	-0.7054	0.626	0.49	0.016
Elevation	921	4.99	4.0070	0.0000	34.1	0.1736	8.172	0.0000	11.606	5.19	0.171
Bio_1	920	301.82	223.2760	0.0039	1127.7	110.9479	392.389	102.3573	711.875	236.94	7.812
Bio_7	922	10.28	10.5000	5.7000	16.5	9.4000	11.000	8.0000	12.100	1.69	0.056
Bio_10	922	29.34	30.3000	23.8000	31.9	27.9000	30.500	27.1000	30.600	1.61	0.053
Bio_11	922	19.27	19.6000	14.2000	24.4	18.5000	20.100	16.6000	20.700	1.70	0.056
Bio_12	916	0.85	0.6000	-3.6000	9.3	-0.2000	1.100	-1.1000	3.700	1.97	0.065
Bio_17	922	1008.26	956.5000	672.0000	1383.0	912.0000	1180.000	778.0000	1310.000	188.34	6.203
Bio_18	922	182.48	158.0000	117.0000	290.0	150.0000	231.000	134.0000	268.000	51.82	1.706
Distance_roads	922	269.01	277.0000	117.0000	363.0	263.0000	293.000	197.0000	317.000	43.00	1.416
Distance_roads_1	922	349.24	141.4214	0.0000	2860.1	0.0000	500.000	0.0000	989.950	467.68	15.402
Distance_roads_2	922	258.19	0.0000	0.0000	2236.1	0.0000	0.000	0.0000	1000.000	490.45	16.152
Distance_watercourses	922	0.00	0.0000	0.0000	0.0	0.0000	0.000	0.0000	0.000	0.00	0.000
Distance_watercourses_1	920	787.93	424.2641	0.0000	11166.5	141.4214	994.975	0.0000	1967.230	1036.96	34.187
Distance_watercourses_2	922	681.80	0.0000	0.0000	11401.8	0.0000	1000.000	0.0000	2000.000	1059.27	34.885
Population density	922	18184.47	295.8368	1.6391	623558.9	146.7771	718.823	66.0753	1743.638	76568.75	2521.658

Variable	All Groups Descriptive Statistics (*Robinia pseudoacacia*)									
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	10252	0.008	0.0087	-0.8247	0.4	-0.0569	0.072	-0.1196	0.135	0.10	0.0010
Northness	10252	-0.078	-0.1012	-0.9783	1.0	-0.3791	0.211	-0.6275	0.502	0.41	0.0041
Slope	10252	5.079	4.6515	0.0000	32.4	2.8497	6.560	0.8353	9.866	3.50	0.0345
Elevation	10247	206.947	196.5298	0.0000	892.0	153.3031	240.077	122.0807	309.401	82.47	0.8147
Bio_1	10229	10.548	10.4000	7.5000	16.3	10.1000	10.800	9.8000	11.100	0.93	0.0092
Bio_7	10229	29.940	30.4000	23.7000	32.0	30.1000	30.500	29.4000	30.700	1.49	0.0147
Bio_10	10229	19.652	19.6000	16.1000	24.4	19.3000	19.900	19.0000	20.400	0.73	0.0072
Bio_11	9804	0.943	0.6000	-2.1000	9.0	0.3000	1.000	-0.1000	1.600	1.42	0.0143
Bio_12	10229	941.185	930.0000	630.0000	1390.0	883.0000	1004.000	786.0000	1087.000	121.02	1.1966
Bio_17	10229	164.408	153.0000	119.0000	282.0	146.0000	178.000	136.0000	212.000	30.84	0.3050
Bio_18	10229	278.069	283.0000	123.0000	343.0	267.0000	298.000	236.0000	309.000	29.70	0.2937
Distance_roads	10253	444.845	360.5551	0.0000	15094.4	141.4214	608.276	100.0000	905.539	479.17	4.7322
Distance_roads_1	10253	274.676	0.0000	0.0000	14866.1	0.0000	1000.000	0.0000	1000.000	557.77	5.5084
Distance_roads_2	10243	18.933	0.0000	0.0000	14142.1	0.0000	0.000	0.0000	0.000	397.87	3.9312
Distance_watercourses	10252	574.446	360.5551	0.0000	31548.2	141.4214	632.456	100.0000	1029.563	1314.03	12.9778
Distance_watercourses_1	10253	419.839	0.0000	0.0000	31400.6	0.0000	1000.000	0.0000	1000.000	1359.06	13.4218
Distance_watercourses_2	10252	151.111	0.0000	0.0000	32015.6	0.0000	0.000	0.0000	0.000	1338.51	13.2196
Population density	10251	3072.134	204.0379	0.7489	636764.2	101.7296	438.741	59.7311	868.000	31065.63	306.8294

Variable	IDPREC=5 Descriptive Statistics (*Robinia pseudoacica*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	58	-0.04	-0.018	-0.7001	0.2	-0.0915	0.053	-0.1815	0.11	0.15	0.02
Northness	58	-0.13	-0.158	-0.8839	0.9	-0.4868	0.130	-0.7256	0.64	0.47	0.06
Slope	58	3.38	2.903	0.0000	14.6	0.8062	5.135	0.1260	7.04	3.17	0.42
Elevation	58	113.83	113.425	0.0000	281.3	69.9641	171.006	8.8309	230.82	75.79	9.95
Bio_1	54	12.33	11.200	10.1000	16.2	11.0000	13.800	10.6000	15.40	1.88	0.26
Bio_7	54	28.73	30.400	23.8000	31.9	26.5000	30.700	25.2000	31.00	2.49	0.34
Bio_10	54	21.14	20.500	19.3000	24.3	20.2000	22.000	19.8000	23.40	1.39	0.19
Bio_11	54	3.28	1.300	0.2000	8.6	0.9000	6.100	0.7000	7.70	2.91	0.40
Bio_12	54	924.89	913.000	630.0000	1390.0	829.0000	1024.000	659.0000	1159.00	180.96	24.63
Bio_17	54	160.83	149.500	120.0000	273.0	136.0000	163.000	126.0000	231.00	38.91	5.30
Bio_18	54	222.33	242.500	126.0000	303.0	154.0000	279.000	137.0000	293.00	60.72	8.26
Distance_roads	58	77.11	100.000	0.0000	400.0	0.0000	100.000	0.0000	200.00	95.99	12.60
Distance_roads_1	58	86.21	0.000	0.0000	1000.0	0.0000	0.000	0.0000	0.00	283.12	37.18
Distance_roads_2	58	0.00	0.000	0.0000	0.0	0.0000	0.000	0.0000	0.00	0.00	0.00
Distance_watercourses	58	2485.42	790.512	0.0000	28800.9	300.0000	3301.515	141.4214	6174.14	4287.06	562.92
Distance_watercourses_1	58	2493.25	1000.000	0.0000	28653.1	0.0000	3162.278	0.0000	6708.20	4282.68	562.34
Distance_watercourses_2	58	2304.35	0.000	0.0000	29154.8	0.0000	5000.000	0.0000	7071.07	4620.74	606.73
Population density	58	21814.21	906.546	52.9174	476323.5	236.8793	3643.332	181.7855	28332.05	87542.03	11494.83

Variable	IDPREC=6 Descriptive Statistics (*Robinia pseudoacacia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	29	-0.036	-0.008	-0.6668	0.37	-0.1185	0.11	-0.2876	0.17	0.206	0.038
Northness	29	-0.114	-0.189	-0.8740	0.62	-0.4411	0.31	-0.5894	0.53	0.425	0.079
Slope	29	9.454	6.736	0.0000	25.99	4.2443	13.60	2.9632	20.36	6.962	1.293
Elevation	28	176.342	132.545	0.0009	746.42	14.4410	335.76	3.1464	352.06	181.527	34.305
Bio_1	26	13.492	13.700	10.9000	16.30	11.9000	14.80	11.5000	15.10	1.571	0.308
Bio_7	26	27.231	27.400	24.8000	28.40	27.0000	27.90	26.1000	28.00	0.890	0.175
Bio_10	26	21.738	21.900	19.5000	24.20	20.5000	22.90	19.8000	23.30	1.361	0.267
Bio_11	26	5.535	5.900	2.5000	9.00	3.5000	7.10	3.2000	7.60	1.974	0.387
Bio_12	26	1002.731	1002.500	844.0000	1367.00	886.0000	1043.00	850.0000	1310.00	147.328	28.893
Bio_17	26	167.692	158.000	123.0000	272.00	140.0000	187.00	131.0000	196.00	37.587	7.371
Bio_18	26	167.731	158.000	123.0000	272.00	140.0000	187.00	131.0000	197.00	37.618	7.377
Distance_roads	29	2151.863	100.000	0.0000	15094.37	0.0000	600.00	0.0000	11307.08	4471.997	830.429
Distance_roads_1	29	2056.909	0.000	0.0000	14764.82	0.0000	1000.00	0.0000	11313.71	4441.302	824.729
Distance_roads_2	29	2020.922	0.000	0.0000	14142.14	0.0000	0.00	0.0000	14142.14	4749.287	881.920
Distance_watercourses	29	6456.578	721.110	0.0000	22487.78	360.5551	16738.58	282.8427	21614.81	8909.757	1654.500
Distance_watercourses_1	29	6276.526	1000.000	0.0000	22022.71	0.0000	17492.86	0.0000	21400.93	8995.140	1670.356
Distance_watercourses_2	29	6069.828	0.000	0.0000	21213.20	0.0000	18027.76	0.0000	21213.20	8877.255	1648.465
Population density	29	831.500	252.678	19.0000	7499.28	108.4997	652.74	21.4177	2326.13	1553.388	288.457

Variable	IDPREC=7 Descriptive Statistics (*Robinia pseudoacacia*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	113	0.00	0.028	-0.7505	0.2	-0.0679	0.08	-0.1477	0.12	0.13	0.013
Northness	113	-0.10	-0.113	-0.9367	0.8	-0.5021	0.27	-0.6970	0.55	0.45	0.042
Slope	113	2.99	0.956	0.0000	18.5	0.4875	3.76	0.0445	7.96	3.96	0.372
Elevation	113	125.75	100.256	0.0000	660.8	93.2563	133.25	21.7619	241.04	93.78	8.822
Bio_1	112	11.31	10.700	8.4000	16.2	10.6000	10.90	10.1000	14.80	1.78	0.168
Bio_7	112	29.97	31.100	23.7000	31.3	30.3000	31.20	25.9000	31.30	2.11	0.199
Bio_10	112	20.32	19.900	17.3000	24.2	19.8000	20.25	19.1000	22.90	1.37	0.130
Bio_11	109	1.82	0.600	-1.2000	8.8	0.6000	1.00	0.4000	7.30	2.65	0.254
Bio_12	112	945.76	924.000	640.0000	1274.0	919.0000	933.00	852.0000	1146.00	108.21	10.225
Bio_17	112	161.07	164.000	123.0000	274.0	155.5000	165.00	135.0000	167.00	19.92	1.882
Bio_18	112	253.62	270.000	130.0000	312.0	262.5000	271.50	144.0000	286.00	46.03	4.349
Distance_roads	113	242.86	100.000	0.0000	2332.4	100.0000	360.56	0.0000	600.00	331.59	31.194
Distance_roads_1	113	157.77	0.000	0.0000	2828.4	0.0000	0.00	0.0000	1000.00	445.08	41.870
Distance_roads_2	113	44.25	0.000	0.0000	5000.0	0.0000	0.00	0.0000	0.00	470.36	44.248
Distance_watercourses	112	2178.47	670.820	0.0000	29130.2	400.0000	1208.30	200.0000	1923.54	5287.53	499.624
Distance_watercourses_1	113	2108.30	1000.000	0.0000	29410.9	0.0000	1000.00	0.0000	2236.07	5329.94	501.399
Distance_watercourses_2	112	1512.08	0.000	0.0000	29154.8	0.0000	0.00	0.0000	0.00	5236.67	494.819
Population density	113	27094.62	4449.175	51.5036	565444.5	564.5335	15197.36	149.8576	32091.05	85286.44	8023.074

Variable	IDPREC=11 Descriptive Statistics (*Robinia pseudoacacia*)									
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	10052	0.008	0.0086	-0.8247	0.4	-0.0566	0.072	-0.1186	0.135	0.10	0.0010
Northness	10052	-0.078	-0.1011	-0.9783	1.0	-0.3775	0.210	-0.6258	0.502	0.41	0.0041
Slope	10052	5.100	4.6791	0.0000	32.4	2.8990	6.574	0.9014	9.863	3.46	0.0345
Elevation	10048	208.483	197.2096	0.0000	892.0	155.1017	240.869	126.4678	310.191	81.17	0.8097
Bio_1	10037	10.523	10.4000	7.5000	16.3	10.1000	10.800	9.8000	11.100	0.89	0.0088
Bio_7	10037	29.953	30.4000	23.8000	32.0	30.1000	30.500	29.5000	30.700	1.47	0.0146
Bio_10	10037	19.631	19.6000	16.1000	24.4	19.3000	19.800	19.0000	20.300	0.69	0.0069
Bio_11	9615	0.907	0.6000	-2.1000	8.9	0.3000	1.000	-0.1000	1.600	1.35	0.0137
Bio_12	10037	941.062	930.0000	636.0000	1358.0	883.0000	1005.000	786.0000	1086.000	120.66	1.2043
Bio_17	10037	164.456	153.0000	119.0000	282.0	146.0000	179.000	136.0000	212.000	30.88	0.3082
Bio_18	10037	278.927	284.0000	123.0000	343.0	267.0000	298.000	238.0000	309.000	28.23	0.2818
Distance_roads	10053	444.313	360.5551	0.0000	14805.4	141.4214	632.456	100.0000	905.539	409.32	4.0824
Distance_roads_1	10053	271.937	0.0000	0.0000	14866.1	0.0000	1000.000	0.0000	1000.000	500.16	4.9884
Distance_roads_2	10043	12.976	0.0000	0.0000	14142.1	0.0000	0.000	0.0000	0.000	290.65	2.9002
Distance_watercourses	10053	528.582	360.5551	0.0000	31548.2	141.4214	608.276	100.0000	1000.000	987.48	9.8487
Distance_watercourses_1	10053	372.002	0.0000	0.0000	31400.6	0.0000	1000.000	0.0000	1000.000	1039.12	10.3638
Distance_watercourses_2	10053	106.452	0.0000	0.0000	32015.6	0.0000	0.000	0.0000	0.000	1016.48	10.1380
Population density	10051	2700.369	199.2020	0.7489	636764.2	100.1506	424.106	59.3973	791.809	29173.23	290.9912

Variable	All Groups Descriptive Statistics (*Veronica persica*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	772	-0.01	-0.004	-0.8414	0.6	-0.0647	0.072	-0.1462	0.1	0.1	0.005
Northness	772	-0.14	-0.185	-0.9603	1.0	-0.5986	0.295	-0.8096	0.6	0.5	0.019
Slope	772	3.78	2.019	0.0000	28.7	0.3490	6.132	0.0003	10.3	4.5	0.162
Elevation	767	184.00	126.468	0.0000	1096.3	105.9909	202.150	45.2978	377.7	170.6	6.159
Bio_1	747	11.21	11.000	6.2000	16.5	10.6000	11.100	9.5000	14.2	1.7	0.063
Bio_7	747	29.39	30.300	23.5000	32.1	28.2000	30.400	26.4000	30.6	1.8	0.066
Bio_10	747	20.24	20.300	14.7000	24.4	19.8000	20.500	18.6000	22.4	1.5	0.055
Bio_11	739	1.84	1.100	-2.5000	9.4	0.7000	1.600	0.1000	6.4	2.4	0.087
Bio_12	747	994.41	953.000	630.0000	1397.0	922.0000	1028.000	874.0000	1272.0	146.8	5.370
Bio_17	747	175.14	164.000	108.0000	294.0	156.0000	182.000	137.0000	242.0	37.3	1.366
Bio_18	747	261.12	280.000	108.0000	350.0	261.0000	286.000	170.0000	299.0	49.3	1.805
Distance_roads	778	425.50	100.000	0.0000	109652.4	0.0000	223.607	0.0000	608.3	4365.3	156.502
Distance_roads_1	778	372.25	0.000	0.0000	109178.8	0.0000	0.000	0.0000	1000.0	4369.8	156.666
Distance_roads_2	778	221.83	0.000	0.0000	107354.6	0.0000	0.000	0.0000	0.0	4332.8	155.338
Distance_watercourses	778	1805.45	620.366	0.0000	108709.0	223.6068	1403.567	100.0000	3048.0	5632.2	201.924
Distance_watercourses_1	778	1694.72	1000.000	0.0000	107935.2	0.0000	1000.000	0.0000	2828.4	5618.3	201.427
Distance_watercourses_2	778	1205.19	0.000	0.0000	107935.2	0.0000	0.000	0.0000	5000.0	5711.3	204.760
Population density	776	49685.48	1247.721	2.0235	545662.9	298.3129	9304.933	117.9213	219718.8	114797.2	4120.978

Variable	IDPREC=5 Descriptive Statistics (*Veronica persica*)									
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	161	-0.02	-0.0259	-0.7001	0.2	-0.0831	0.054	-0.1529	0.10	0.1	0.009
Northness	161	-0.11	-0.2312	-0.9271	0.9	-0.6101	0.330	-0.8074	0.76	0.6	0.044
Slope	161	4.21	2.9853	0.0000	19.1	0.8156	6.402	0.0003	9.99	4.0	0.314
Elevation	159	168.93	125.6832	0.0000	930.9	86.8640	186.273	17.5960	326.34	170.7	13.541
Bio_1	156	11.83	11.1000	7.5000	16.2	10.8000	13.300	9.9000	14.90	1.9	0.155
Bio_7	156	28.82	29.7000	24.4000	32.1	27.0000	30.400	25.7000	30.70	2.0	0.159
Bio_10	156	20.69	20.5000	15.9000	24.4	20.0000	21.650	19.1000	23.20	1.6	0.129
Bio_11	151	2.84	1.4000	-1.2000	8.6	0.9000	5.500	0.6000	7.10	2.7	0.220
Bio_12	156	1014.22	980.0000	630.0000	1397.0	915.0000	1133.000	694.0000	1309.00	193.0	15.453
Bio_17	156	181.28	166.0000	120.0000	294.0	144.0000	215.000	133.0000	255.00	44.0	3.521
Bio_18	156	241.28	269.0000	125.0000	335.0	201.5000	281.000	138.0000	292.00	55.9	4.478
Distance_roads	161	101.43	100.0000	0.0000	1100.0	0.0000	100.000	0.0000	223.61	174.7	13.769
Distance_roads_1	161	86.96	0.0000	0.0000	1000.0	0.0000	0.000	0.0000	0.00	282.7	22.276
Distance_roads_2	161	0.00	0.0000	0.0000	0.0	0.0000	0.000	0.0000	0.00	0.0	0.000
Distance_watercourses	161	1439.98	565.6854	0.0000	13379.5	223.6068	1581.139	100.0000	3889.73	2280.6	179.733
Distance_watercourses_1	161	1315.82	0.0000	0.0000	13453.6	0.0000	1414.214	0.0000	3605.55	2307.9	181.890
Distance_watercourses_2	161	936.09	0.0000	0.0000	14142.1	0.0000	0.000	0.0000	5000.00	2572.6	202.749
Population density	161	36775.36	902.2424	15.1047	476323.5	318.8504	3866.909	105.5427	43797.61	113417.2	8938.529

Variable	IDPREC=6 Descriptive Statistics (*Veronica persica*)										
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	138	-0.03	-0.0193	-0.8414	0.3	-0.0661	0.073	-0.1933	0.1	0.18	0.015
Northness	138	-0.04	-0.0661	-0.9422	1.0	-0.4895	0.424	-0.6883	0.6	0.51	0.044
Slope	138	6.69	6.1075	0.0000	28.7	1.4549	10.624	0.3086	13.9	5.50	0.468
Elevation	139	253.63	190.6160	0.0000	1096.3	111.3706	305.537	31.9206	671.3	223.59	18.965
Bio_1	132	10.81	10.6000	6.2000	16.2	9.8000	11.350	8.9000	13.6	1.84	0.160
Bio_7	132	29.07	30.0000	24.1000	31.2	27.5500	30.400	26.4000	30.4	1.70	0.148
Bio_10	132	19.78	19.9000	14.7000	23.9	19.0500	20.500	17.5000	21.7	1.67	0.146
Bio_11	130	1.55	1.0000	-2.5000	8.9	0.2000	2.200	-0.6500	5.7	2.36	0.207
Bio_12	132	1047.79	978.0000	683.0000	1393.0	950.5000	1106.500	923.0000	1321.0	151.30	13.169
Bio_17	132	186.94	165.0000	126.0000	290.0	159.0000	216.000	155.0000	265.0	42.63	3.710
Bio_18	132	267.80	280.0000	128.0000	346.0	267.5000	297.000	184.0000	307.0	48.77	4.245
Distance_roads	139	249.39	200.0000	0.0000	1431.8	100.0000	360.555	0.0000	600.0	267.10	22.655
Distance_roads_1	139	151.08	0.0000	0.0000	1000.0	0.0000	0.000	0.0000	1000.0	359.42	30.486
Distance_roads_2	139	0.00	0.0000	0.0000	0.0	0.0000	0.000	0.0000	0.0	0.00	0.000
Distance_watercourses	139	1236.70	500.0000	0.0000	28410.2	200.0000	1392.839	100.0000	2707.4	2777.27	235.565
Distance_watercourses_1	139	1081.03	0.0000	0.0000	28071.3	0.0000	1414.214	0.0000	2828.4	2781.36	235.912
Distance_watercourses_2	139	754.87	0.0000	0.0000	25495.1	0.0000	0.000	0.0000	5000.0	2849.86	241.722
Population density	139	29385.17	738.1871	2.4476	467772.3	292.3803	4390.977	112.6202	123030.3	79305.76	6726.627

Variable	IDPREC=7 Descriptive Statistics (*Veronica persica*)									
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	129	0.0	0.02	-0.2336	0.2	-0.046	0.1	-0.0810	0.1	0.1	0.01
Northness	129	-0.4	-0.49	-0.9603	0.6	-0.701	0.0	-0.9074	0.4	0.5	0.04
Slope	129	1.9	0.76	0.0000	25.1	0.111	1.6	0.0321	6.0	3.5	0.31
Elevation	129	149.8	122.09	20.8588	969.0	115.563	127.5	91.1853	145.2	151.6	13.35
Bio_1	129	11.1	11.00	6.7000	16.5	10.700	11.1	10.6000	11.1	1.5	0.13
Bio_7	129	30.0	30.50	23.5000	31.3	30.400	30.5	27.5000	31.2	1.7	0.15
Bio_10	129	20.3	20.40	15.3000	24.2	19.900	20.5	19.9000	20.5	1.3	0.11
Bio_11	128	1.4	1.10	-2.3000	9.4	0.700	1.2	0.6000	1.3	2.0	0.18
Bio_12	129	962.0	935.00	778.0000	1349.0	924.000	955.0	916.0000	972.0	99.6	8.77
Bio_17	129	164.6	161.00	108.0000	290.0	158.000	165.0	155.0000	166.0	26.9	2.37
Bio_18	129	269.5	282.00	108.0000	350.0	270.000	283.0	268.0000	286.0	41.0	3.61
Distance_roads	129	137.3	100.00	0.0000	922.0	0.000	100.0	0.0000	500.0	209.3	18.43
Distance_roads_1	129	62.0	0.00	0.0000	1000.0	0.000	0.0	0.0000	0.0	242.1	21.32
Distance_roads_2	129	0.0	0.00	0.0000	0.0	0.000	0.0	0.0000	0.0	0.0	0.00
Distance_watercourses	129	2063.1	943.40	0.0000	31715.8	200.000	2200.0	100.0000	2701.9	5251.9	462.40
Distance_watercourses_1	129	2013.0	1000.00	0.0000	31384.7	0.000	2236.1	0.0000	2828.4	5235.3	460.94
Distance_watercourses_2	129	1115.2	0.00	0.0000	33541.0	0.000	0.0	0.0000	0.0	5441.1	479.06
Population density	129	150163.7	58728.15	2.0235	545662.9	1899.352	324222.8	253.7741	400539.8	173915.9	15312.44

Variable	IDPREC=11 Descriptive Statistics (*Veronica persica*)									
	Valid N	Mean	Median	Minimum	Maximum	Lower Quartile	Upper Quartile	Percentile 10	Percentile 90	Std.Dev.	Standard Error
Eastness	344	-0.01	0.002	-0.7661	0.6	-0.0715	0.075	-0.1362	0.1	0.14	0.007
Northness	344	-0.11	-0.153	-0.9530	1.0	-0.5742	0.345	-0.7995	0.6	0.53	0.029
Slope	344	3.12	1.192	0.0000	22.8	0.1137	4.923	0.0000	9.0	4.02	0.217
Elevation	340	175.58	139.667	0.0000	805.4	105.9117	179.419	45.5624	354.0	143.18	7.765
Bio_1	330	11.11	10.900	7.5000	16.3	10.5000	11.100	9.5500	14.3	1.60	0.088
Bio_7	330	29.54	30.300	23.8000	32.0	29.8000	30.400	26.9500	30.5	1.68	0.093
Bio_10	330	20.17	20.100	16.1000	24.4	19.8000	20.500	18.7500	22.3	1.37	0.076
Bio_11	330	1.65	1.100	-1.8000	8.9	0.7000	1.400	-0.1000	6.6	2.21	0.122
Bio_12	330	976.38	950.000	681.0000	1351.0	914.0000	1010.000	847.0000	1171.0	127.47	7.017
Bio_17	330	171.65	163.000	122.0000	279.0	155.0000	178.000	137.0000	205.5	33.37	1.837
Bio_18	330	264.55	280.000	123.0000	343.0	268.0000	288.000	184.0000	296.0	46.87	2.580
Distance_roads	349	751.66	100.000	0.0000	109652.4	0.0000	360.555	0.0000	894.4	6503.04	348.100
Distance_roads_1	349	706.62	0.000	0.0000	109178.8	0.0000	0.000	0.0000	1000.0	6505.47	348.230
Distance_roads_2	349	494.50	0.000	0.0000	107354.6	0.0000	0.000	0.0000	0.0	6463.79	345.999
Distance_watercourses	349	2105.34	632.456	0.0000	108709.0	223.6068	1063.015	100.0000	3361.5	7411.21	396.713
Distance_watercourses_1	349	1996.28	1000.000	0.0000	107935.2	0.0000	1000.000	0.0000	3000.0	7384.78	395.298
Distance_watercourses_2	349	1541.94	0.000	0.0000	107935.2	0.0000	0.000	0.0000	5000.0	7446.21	398.586
Population density	347	26453.72	950.354	4.0335	545662.9	266.7894	3590.650	112.7058	134378.5	72959.94	3916.695

Appendix 9. Results of Tukey post-hoc test.

Tukey HSD test; variable Eastness (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.01629, df = 841.00					
IDPREC	5	6	7	11	all
5		0.977309	0.409751	0.220342	0.525805
6	0.977309		0.094760	0.019139	0.089278
7	0.409751	0.094760		1.000000	0.958593
11	0.220342	0.019139	1.000000		0.749335
all	0.525805	0.089278	0.958593	0.749335	
	ab	**a**	**ab**	**b**	**ab**

Tukey HSD test; variable Northness (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.28753, df = 841.00					
IDPREC	5	6	7	11	all
5		0.613943	0.296069	0.817253	0.697939
6	0.613943		0.989894	0.944459	0.977170
7	0.296069	0.989894		0.592706	0.687349
11	0.817253	0.944459	0.592706		0.996811
all	0.697939	0.977170	0.687349	0.996811	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable slopehtrsj (*Ailanthus altissima)* Approximate Probabilities for Post Hoc Tests Error: Between MS = 48.205, df = 841.00					
IDPREC	5	6	7	11	all
5		0.521822	0.110446	0.309030	0.866446
6	0.521822		0.000195	1.000000	0.794023
7	0.110446	0.000195		0.000017	0.000038
11	0.309030	1.000000	0.000017		0.276454
all	0.866446	0.794023	0.000038	0.276454	
	ab	**a**	**b**	**a**	**a**

Tukey HSD test; variable Elevation (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 12383., df = 841.00					
IDPREC	5	6	7	11	all
5		0.004815	0.999750	0.999974	0.975399
6	0.004815		0.000543	0.000065	0.000279
7	0.999750	0.000543		0.995565	0.861329
11	0.999974	0.000065	0.995565		0.867432
all	0.975399	0.000279	0.861329	0.867432	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Bio_1 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 3.6641, df = 841.00

IDPREC	5	6	7	11	all
5		0.260502	0.000017	0.137748	0.032354
6	0.260502		0.002282	0.999615	0.997808
7	0.000017	0.002282		0.000020	0.000034
11	0.137748	0.999615	0.000020		0.870900
all	0.032354	0.997808	0.000034	0.870900	
	a	**ab**	**c**	**ab**	**b**

Tukey HSD test; variable Bio_7 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 4.7292, df = 841.00

IDPREC	5	6	7	11	all
5		0.998574	0.000017	0.056883	0.033340
6	0.998574		0.000017	0.009301	0.004076
7	0.000017	0.000017		0.000017	0.000017
11	0.056883	0.009301	0.000017		0.999538
all	0.033340	0.004076	0.000017	0.999538	
	bcd	**bc**	**e**	**abd**	**ad**

Tukey HSD test; variable Bio_10 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 2.0770, df = 841.00

IDPREC	5	6	7	11	all
5		0.066489	0.000020	0.237821	0.050707
6	0.066489		0.093949	0.684808	0.954896
7	0.000020	0.093949		0.000035	0.000221
11	0.237821	0.684808	0.000035		0.758907
all	0.050707	0.954896	0.000221	0.758907	
	a	**ab**	**b**	**a**	**a**

Tukey HSD test; variable Bio_11 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 8.2204, df = 841.00

IDPREC	5	6	7	11	all
5		0.599602	0.000017	0.073151	0.019041
6	0.599602		0.000028	0.916556	0.690947
7	0.000017	0.000028		0.000017	0.000018
11	0.073151	0.916556	0.000017		0.937712
all	0.019041	0.690947	0.000018	0.937712	
	a	**ab**	**c**	**ab**	**b**

Tukey HSD test; variable Bio_12 (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 17798., df = 841.00					
IDPREC	5	6	7	11	all
5		0.421868	0.065594	0.002423	0.087383
6	0.421868		0.000045	0.000017	0.000020
7	0.065594	0.000045		0.970410	0.916261
11	0.002423	0.000017	0.970410		0.095289
all	0.087383	0.000020	0.916261	0.095289	
	abc	**ab**	**acd**	**cd**	**acd**

Tukey HSD test; variable Bio_17 (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 878.04, df = 841.00					
IDPREC	5	6	7	11	all
5		0.031656	0.693789	0.149824	0.748012
6	0.031656		0.000064	0.000017	0.000018
7	0.693789	0.000064		0.903854	0.990895
11	0.149824	0.000017	0.903854		0.152786
all	0.748012	0.000018	0.990895	0.152786	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Bio_18 (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 3706.5, df = 841.00					
IDPREC	5	6	7	11	all
5		0.773475	0.000020	0.883650	0.386956
6	0.773475		0.000437	0.981125	0.998092
7	0.000020	0.000437		0.000017	0.000018
11	0.883650	0.981125	0.000017		0.489612
all	0.386956	0.998092	0.000018	0.489612	
	a	**a**	**b**	**a**	**a**

Tukey HSD test; variable Distance_roads (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 3879E2, df = 841.00					
IDPREC	5	6	7	1	all
5		0.157041	0.768667	0.959347	0.841081
6	0.157041		0.708141	0.142040	0.245857
7	0.768667	0.708141		0.920188	0.988907
11	0.959347	0.142040	0.920188		0.968682
all	0.841081	0.245857	0.988907	0.968682	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_roads_1 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 4680E2, df = 841.00

IDPREC	5	6	7	11	all
5		0.559853	0.978871	0.999999	0.997284
6	0.559853		0.826864	0.232976	0.411166
7	0.978871	0.826864		0.912798	0.992108
11	0.999999	0.232976	0.912798		0.945697
all	0.997284	0.411166	0.992108	0.945697	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_roads_2 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 5856E2, df = 841.00

IDPREC	5	6	7	1	all
5		0.665825	0.618416	0.999861	0.975516
6	0.665825		1.000000	0.474006	0.737346
7	0.618416	1.000000		0.370551	0.651364
11	0.999861	0.474006	0.370551		0.911187
all	0.975516	0.737346	0.651364	0.911187	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses (*Ailanthus altissim*a)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 2303E4, df = 841.00

IDPREC	5	6	7	11	all
5		0.731304	0.772543	0.262984	0.444194
6	0.731304		0.999912	0.987223	0.999975
7	0.772543	0.999912		0.947446	0.998002
11	0.262984	0.987223	0.947446		0.941589
all	0.444194	0.999975	0.998002	0.941589	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watersourses_1 (*Ailanthus altissima*)
Approximate Probabilities for Post Hoc Tests
Error: Between MS = 2289E4, df = 841.00

IDPREC	5	6	7	11	all
5		0.681818	0.788718	0.215439	0.399487
6	0.681818		0.998980	0.986848	0.999995
7	0.788718	0.998980		0.895542	0.992217
11	0.215439	0.986848	0.895542		0.921175
all	0.399487	0.999995	0.992217	0.921175	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses_2 (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2414E4, df = 841.00					
IDPREC	5	6	7	11	all
5		0.518809	0.479301	0.041536	0.137948
6	0.518809		1.000000	0.895302	0.997427
7	0.479301	1.000000		0.847327	0.995033
11	0.041536	0.895302	0.847327		0.802914
all	0.137948	0.997427	0.995033	0.802914	
	a	**ab**	**ab**	**b**	**ab**

Tukey HSD test; variable Population density (*Ailanthus altissima*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2090E7, df = 841.00					
IDPREC	5	6	7	11	all
5		0.963028	0.464246	0.991944	0.988073
6	0.963028		0.094629	0.639619	0.582652
7	0.464246	0.094629		0.373452	0.351533
11	0.991944	0.639619	0.373452		0.999995
all	0.988073	0.582652	0.351533	0.999995	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Eastness (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.01267, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.002695	0.826529	0.848564	0.948391
6	0.002695		0.010270	0.000410	0.000594
7	0.826529	0.010270		0.926886	0.900011
11	0.848564	0.000410	0.926886		0.981251
all	0.948391	0.000594	0.900011	0.981251	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Northness (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.29746, df = 1739.0					
IDPREC	5	6	7	11	all
5		1.000000	0.999435	0.070459	0.186371
6	1.000000		0.999853	0.899769	0.945525
7	0.999435	0.999853		0.882838	0.925705
11	0.070459	0.899769	0.882838		0.913680
all	0.186371	0.945525	0.925705	0.913680	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Slope (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 15.245, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.505244	0.999974	0.167865	0.288528
6	0.505244		0.869580	0.893970	0.851191
7	0.999974	0.869580		0.987433	0.993623
11	0.167865	0.893970	0.987433		0.978108
all	0.288528	0.851191	0.993623	0.978108	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Elevation (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 16667., df = 1739.0					
IDPREC	5	6	7	11	all
5		0.015234	0.003696	0.000017	0.000017
6	0.015234		0.942517	0.829164	0.666912
7	0.003696	0.942517		0.351981	0.233386
11	0.000017	0.829164	0.351981		0.478296
all	0.000017	0.666912	0.233386	0.478296	
	a	**b**	**b**	**b**	**b**

Tukey HSD test; variable Bio_1 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1.3735, df = 1739.0					
IDPREC	5	6	7	1	all
5		0.547305	0.028050	0.000017	0.000017
6	0.547305		0.671192	0.000053	0.000480
7	0.028050	0.671192		0.000018	0.000021
11	0.000017	0.000053	0.000018		0.009554
all	0.000017	0.000480	0.000021	0.009554	
	a	**ab**	**b**	**c**	**d**

Tukey HSD test; variable Bio_7 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1.1871, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.000058	0.000017	0.241277	0.674157
6	0.000058		0.518876	0.000018	0.000019
7	0.000017	0.518876		0.000017	0.000017
11	0.241277	0.000018	0.000017		0.612075
all	0.674157	0.000019	0.000017	0.612075	
	a	**b**	**b**	**a**	**a**

Tukey HSD test; variable Bio_10 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1.1144, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.999692	0.235382	0.000017	0.000017
6	0.999692		0.548115	0.012539	0.059463
7	0.235382	0.548115		0.000064	0.000353
11	0.000017	0.012539	0.000064		0.019406
all	0.000017	0.059463	0.000353	0.019406	
	ac	**abc**	**ac**	**d**	**bc**

Tukey HSD test; variable Bio_11 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.4580, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.025603	0.000374	0.000017	0.000017
6	0.025603		0.670315	0.000017	0.000019
7	0.000374	0.670315		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.017605
all	0.000017	0.000019	0.000017	0.017605	
	a	**b**	**b**	**c**	**d**

Tukey HSD test; variable Bio_12 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 17442., df = 1739.0					
IDPREC	5	6	7	11	all
5		0.000305	0.016761	0.000017	0.000017
6	0.000305		0.998524	0.571427	0.333809
7	0.016761	0.998524		0.915314	0.773408
11	0.000017	0.571427	0.915314		0.177318
all	0.000017	0.333809	0.773408	0.177318	
	a	**b**	**b**	**b**	**b**

Tukey HSD test; variable Bio_17 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1043.6, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.001530	0.224736	0.000020	0.000067
6	0.001530		0.922059	0.172813	0.107891
7	0.224736	0.922059		0.943756	0.888197
11	0.000020	0.172813	0.943756		0.754436
all	0.000067	0.107891	0.888197	0.754436	
	a	**b**	**ab**	**b**	**b**

Tukey HSD test; variable Bio_18 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1509.9, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.338330	0.035927	0.000017	0.000017
6	0.338330		0.836430	0.000017	0.000017
7	0.035927	0.836430		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.000061
all	0.000017	0.000017	0.000017	0.000061	
	a	**ab**	**b**	**c**	**d**

Tukey HSD test; variable Distance_roads (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 8337E4, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.999982	0.000017	0.999238	0.766589
6	0.999982		0.000017	1.000000	0.998521
7	0.000017	0.000017		0.000017	0.000017
11	0.999238	1.000000	0.000017		0.396986
all	0.766589	0.998521	0.000017	0.396986	
	a	**a**	**b**	**a**	**a**

Tukey HSD test; variable Distance_roads_1 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1660E2, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.938220	0.999496	0.010915	0.045306
6	0.938220		0.997208	0.998879	0.999976
7	0.999496	0.997208		0.966227	0.985662
11	0.010915	0.998879	0.966227		0.873065
all	0.045306	0.999976	0.985662	0.873065	
	a	**ab**	**ab**	**b**	**b**

Tukey HSD test; variable Distance_roads_2 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1145E2, df = 1739.0					
IDPREC	5	6	7	11	all
5		1.000000	0.920114	0.916921	0.946963
6	1.000000		0.963599	0.998662	0.999234
7	0.920114	0.963599		0.970895	0.965300
11	0.916921	0.998662	0.970895		0.999519
all	0.946963	0.999234	0.965300	0.999519	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 5977E3, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.962684	0.281420	0.000105	0.001494
6	0.962684		0.257889	0.192454	0.298094
7	0.281420	0.257889		0.926028	0.852231
11	0.000105	0.192454	0.926028		0.659423
all	0.001494	0.298094	0.852231	0.659423	
	a	**ab**	**ab**	**b**	**b**

Tukey HSD test; variable Distance_watercourses_1 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 5983E3, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.884170	0.360774	0.000119	0.001773
6	0.884170		0.231871	0.107907	0.181842
7	0.360774	0.231871		0.962100	0.908515
11	0.000119	0.107907	0.962100		0.646053
all	0.001773	0.181842	0.908515	0.646053	
	a	**ab**	**ab**	**b**	**b**

Tukey HSD test; variable Distance_watercourses_2 (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 5363E3, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.943690	0.661681	0.000022	0.000236
6	0.943690		0.513745	0.104535	0.190727
7	0.661681	0.513745		1.000000	0.999181
11	0.000022	0.104535	1.000000		0.509040
all	0.000236	0.190727	0.999181	0.509040	
	a	**ab**	**ab**	**b**	**b**

Tukey HSD test; variable Population density (*Ambrosia artemisiifolia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 3638E6, df = 1739.0					
IDPREC	5	6	7	11	all
5		0.952746	0.960114	0.995379	0.998855
6	0.952746		0.999994	0.907420	0.920391
7	0.960114	0.999994		0.929098	0.938227
11	0.995379	0.907420	0.929098		0.999398
all	0.998855	0.920391	0.938227	0.999398	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Eastness (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.01047, df = 349.00					
IDPREC	5	6	7	11	all
5		0.238664	0.822786	0.996741	0.996145
6	0.238664		0.676454	0.087618	0.218719
7	0.822786	0.676454		0.433373	0.837812
11	0.996741	0.087618	0.433373		0.810366
all	0.996145	0.218719	0.837812	0.810366	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Northness (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.22538, df = 349.00					
IDPREC	5	6	7	11	all
5		0.220301	0.999941	0.495505	0.977870
6	0.220301		0.237874	0.005734	0.043788
7	0.999941	0.237874		0.331223	0.930626
11	0.495505	0.005734	0.331223		0.452297
all	0.977870	0.043788	0.930626	0.452297	
	ab	**a**	**ab**	**b**	**b**

Tukey HSD test; variable Slope (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 9.6795, df = 349.00					
IDPREC	5	6	7	11	all
5		0.260482	0.828108	0.897235	0.983522
6	0.260482		0.036269	0.036738	0.062328
7	0.828108	0.036269		0.996865	0.918374
11	0.897235	0.036738	0.996865		0.970682
all	0.983522	0.062328	0.918374	0.970682	
	ab	**a**	**b**	**b**	**ab**

Tukey HSD test; variable Elevation (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2648.1, df = 349.00					
IDPREC	5	6	7	11	all
5		0.954778	0.013283	0.029794	0.114869
6	0.954778		0.018794	0.043793	0.117624
7	0.013283	0.018794		0.926991	0.461471
11	0.029794	0.043793	0.926991		0.830397
all	0.114869	0.117624	0.461471	0.830397	
	a	**a**	**b**	**b**	**ab**

Tukey HSD test; variable Bio_1 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.13136, df = 349.00					
IDPREC	5	6	7	11	all
5		0.007935	0.863828	0.035588	0.155993
6	0.007935		0.056056	0.422762	0.147448
7	0.863828	0.056056		0.353390	0.787339
11	0.035588	0.422762	0.353390		0.776182
sve	0.155993	0.147448	0.787339	0.776182	
	a	**b**	**ab**	**b**	**ab**

Tukey HSD test; variable Bio_7 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.32772, df = 349.00					
IDPREC	5	6	7	11	all
5		0.001046	0.056297	0.986313	0.982789
6	0.001046		0.000017	0.000053	0.000034
7	0.056297	0.000017		0.043248	0.021491
11	0.986313	0.000053	0.043248		1.000000
all	0.982789	0.000034	0.021491	1.000000	
	ab	**c**	**a**	**b**	**b**

Tukey HSD test; variable Bio_10 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.16937, df = 349.00					
IDPREC	5	6	7	11	all
5		0.024583	0.931840	0.030687	0.180472
6	0.024583		0.099080	0.693210	0.297037
7	0.931840	0.099080		0.211993	0.684442
11	0.030687	0.693210	0.211993		0.668166
all	0.180472	0.297037	0.684442	0.668166	
	a	**b**	**ab**	**b**	**ab**

Tukey HSD test; variable Bio_11 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.17193, df = 349.00					
IDPREC	5	6	7	11	all
5		0.000030	0.999995	0.192471	0.380541
6	0.000030		0.000022	0.001115	0.000160
7	0.999995	0.000022		0.114286	0.253299
11	0.192471	0.001115	0.114286		0.935109
all	0.380541	0.000160	0.253299	0.935109	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Bio_12 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 11084., df = 349.00					
IDPREC	5	6	7	11	All
5		0.000036	0.420593	0.913264	0.526196
6	0.000036		0.002949	0.000047	0.000128
7	0.420593	0.002949		0.740566	0.970655
11	0.913264	0.000047	0.740566		0.881225
all	0.526196	0.000128	0.970655	0.881225	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Bio_17 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 431.82, df = 349.00					
IDPREC	5	6	7	11	all
5		0.000018	0.106323	0.518534	0.168897
6	0.000018		0.001778	0.000027	0.000045
7	0.106323	0.001778		0.667063	0.913049
11	0.518534	0.000027	0.667063		0.928348
all	0.168897	0.000045	0.913049	0.928348	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Bio_18 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 823.73, df = 349.00					
IDPREC	5	6	7	11	all
5		0.218763	0.999994	0.976477	0.999999
6	0.218763		0.218044	0.050074	0.109431
7	0.999994	0.218044		0.951726	0.999919
11	0.976477	0.050074	0.951726		0.906637
all	0.999999	0.109431	0.999919	0.906637	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_roads (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2049E2, df = 349.00					
IDPREC	5	6	7	11	all
5		0.508352	0.099545	0.000165	0.009476
6	0.508352		0.999713	0.744070	0.996624
7	0.099545	0.999713		0.512631	0.999311
11	0.000165	0.744070	0.512631		0.267101
all	0.009476	0.996624	0.999311	0.267101	
	a	**ab**	**ab**	**b**	**b**

Tukey HSD test; variable Distance_roads_1 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2366E2, df = 349.00					
IDPREC	5	6	7	11	all
5		0.529023	0.740617	0.006150	0.112589
6	0.529023		0.957981	0.972781	0.999779
7	0.740617	0.957981		0.208066	0.867322
11	0.006150	0.972781	0.208066		0.368363
all	0.112589	0.999779	0.867322	0.368363	
	a	**ab**	**ab**	**b**	**ab**

Tukey HSD test; variable Distance_roads_2 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2778E2, df = 349.00					
IDPREC	5	6	7	11	all
5		1.000000	0.257625	1.000000	0.980027
6	1.000000		0.571717	1.000000	0.995887
7	0.257625	0.571717		0.090472	0.221154
11	1.000000	1.000000	0.090472		0.921063
all	0.980027	0.995887	0.221154	0.921063	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 3549E2, df = 349.00					
IDPREC	5	6	7	11	all
5		0.004258	0.254549	0.122067	0.138493
6	0.004258		0.220111	0.165777	0.100372
7	0.254549	0.220111		1.000000	0.999603
11	0.122067	0.165777	1.000000		0.997394
all	0.138493	0.100372	0.999603	0.997394	
	a	**b**	**ab**	**ab**	**ab**

Tukey HSD test; variable Distance_watercourses_1 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 4531E2, df = 349.00					
IDPREC	5	6	7	11	all
5		0.000605	0.540866	0.174186	0.195956
6	0.000605		0.024238	0.030195	0.014623
7	0.540866	0.024238		0.989877	0.998699
11	0.174186	0.030195	0.989877		0.997821
sve	0.195956	0.014623	0.998699	0.997821	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses_2 (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2786E2, df = 349.00					
IDPREC	5	6	7	11	all
5		0.170309	1.000000	0.986183	0.980142
6	0.170309		0.150531	0.217183	0.193781
7	1.000000	0.150531		0.982129	0.973352
11	0.986183	0.217183	0.982129		1.000000
all	0.980142	0.193781	0.973352	1.000000	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Population density (*Echinocystis lobata*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1569E5, df = 349.00					
IDPREC	5	6	7	11	all
5		0.000017	0.095997	0.999794	0.682531
6	0.000017		0.000711	0.000017	0.000017
7	0.095997	0.000711		0.009953	0.315453
11	0.999794	0.000017	0.009953		0.177367
all	0.682531	0.000017	0.315453	0.177367	
	ac	**b**	**a**	**c**	**ac**

Tukey HSD test; variable Eastness (*Erigeron annuus)* Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.01013, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.952156	0.773322	0.999860	0.993080
6	0.952156		0.998285	0.938953	0.982825
7	0.773322	0.998285		0.561332	0.736772
11	0.999860	0.938953	0.561332		0.981852
all	0.993080	0.982825	0.736772	0.981852	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Northness (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.24956, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.993473	0.495859	0.946277	0.999531
6	0.993473		0.276329	0.999883	0.996795
7	0.495859	0.276329		0.009487	0.053040
11	0.946277	0.999883	0.009487		0.786757
all	0.999531	0.996795	0.053040	0.786757	
	ab	**ab**	**a**	**b**	**ab**

Tukey HSD test; variable Slope (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 24.138, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000021	0.847525	0.000040	0.004079
6	0.000021		0.000017	0.220556	0.007068
7	0.847525	0.000017		0.000017	0.000017
11	0.000040	0.220556	0.000017		0.048475
all	0.004079	0.007068	0.000017	0.048475	
	a	**b**	**a**	**b**	**c**

Tukey HSD test; variable Elevation (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 53217., df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000017	0.999929	0.000017	0.000018
6	0.000017		0.000017	0.001018	0.000018
7	0.999929	0.000017		0.000017	0.000017
11	0.000017	0.001018	0.000017		0.022636
all	0.000018	0.000018	0.000017	0.022636	
	a	**b**	**a**	**c**	**d**

Tukey HSD test; variable Bio_1 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.6488, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000017	0.017851	0.000017	0.000017
6	0.000017		0.003220	0.551468	0.096420
7	0.017851	0.003220		0.004290	0.125358
11	0.000017	0.551468	0.004290		0.224869
all	0.000017	0.096420	0.125358	0.224869	
	a	**bc**	**bd**	**bc**	**bcd**

Tukey HSD test; variable Bio_7 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.5732, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000936	0.002205	0.042371	0.526912
6	0.000936		0.000017	0.117693	0.002547
7	0.002205	0.000017		0.000017	0.000017
11	0.042371	0.117693	0.000017		0.053166
all	0.526912	0.002547	0.000017	0.053166	
	ab	**cd**	**e**	**acd**	**abc**

Tukey HSD test; variable Bio_10 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.6470, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000017	0.119146	0.000017	0.000017
6	0.000017		0.000021	0.210135	0.009674
7	0.119146	0.000021		0.000023	0.002446
11	0.000017	0.210135	0.000023		0.096283
all	0.000017	0.009674	0.002446	0.096283	
	a	**b**	**a**	**bc**	**c**

Tukey HSD test; variable Bio_11 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 3.6689, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000841	0.001671	0.000027	0.000096
6	0.000841		0.926046	0.987807	0.855431
7	0.001671	0.926046		0.975840	0.999997
11	0.000027	0.987807	0.975840		0.798894
all	0.000096	0.855431	0.999997	0.798894	
	a	**b**	**b**	**b**	**b**

Tukey HSD test; variable Bio_12 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 32644., df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000017	0.890914	0.000017	0.000026
6	0.000017		0.000017	0.036875	0.000621
7	0.890914	0.000017		0.000017	0.000031
11	0.000017	0.036875	0.000017		0.093482
all	0.000026	0.000621	0.000031	0.093482	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Bio_17 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2258.6, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000017	0.919671	0.000021	0.000172
6	0.000017		0.000017	0.000590	0.000027
7	0.919671	0.000017		0.000021	0.000292
11	0.000021	0.000590	0.000021		0.391387
all	0.000172	0.000027	0.000292	0.391387	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Bio_18 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1753.1, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.610099	0.000023	0.000017	0.000019
6	0.610099		0.015903	0.001745	0.030417
7	0.000023	0.015903		0.999517	0.841608
11	0.000017	0.001745	0.999517		0.236997
all	0.000019	0.030417	0.841608	0.236997	
	a	**a**	**b**	**b**	**b**

Tukey HSD test; variable Distance_roads (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2314E2, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000017	0.006070	0.000017	0.000017
6	0.000017		0.000017	0.000019	0.000017
7	0.006070	0.000017		0.011371	0.083131
11	0.000017	0.000019	0.011371		0.674415
all	0.000017	0.000017	0.083131	0.674415	
	a	**b**	**cd**	**de**	**cde**

Tukey HSD test; variable Distance_roads (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2426E2, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.000020	0.999898	0.002918	0.025598
6	0.000020		0.000017	0.012852	0.000850
7	0.999898	0.000017		0.000040	0.000708
11	0.002918	0.012852	0.000040		0.547841
all	0.025598	0.000850	0.000708	0.547841	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Distance_roads_2 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1397E2, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.893723	0.002221	1.000000	0.911861
6	0.893723		0.099427	0.774873	0.995042
7	0.002221	0.099427		0.000018	0.000081
11	1.000000	0.774873	0.000018		0.382248
all	0.911861	0.995042	0.000081	0.382248	
	a	**ab**	**b**	**a**	**a**

Tukey HSD test; variable Distance_watercourses (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1337E3, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.868330	0.079448	0.365444	0.492161
6	0.868330		0.004479	0.029204	0.047535
7	0.079448	0.004479		0.581606	0.347737
11	0.365444	0.029204	0.581606		0.985340
all	0.492161	0.047535	0.347737	0.985340	
	ab	**a**	**b**	**b**	**b**

Tukey HSD test; variable Distance_watercourses_1 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1398E3, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.860644	0.058185	0.252666	0.390065
6	0.860644		0.002763	0.014779	0.028849
7	0.058185	0.002763		0.641284	0.362428
11	0.252666	0.014779	0.641284		0.969407
sve	0.390065	0.028849	0.362428	0.969407	
	ab	**a**	**b**	**b**	**b**

Tukey HSD test; variable Distance_watercourses_2 (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1295E3, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.974844	0.000179	0.010163	0.016481
6	0.974844		0.006302	0.165459	0.230714
7	0.000179	0.006302		0.166935	0.068508
11	0.010163	0.165459	0.166935		0.989708
all	0.016481	0.230714	0.068508	0.989708	
	ab	**abc**	**cd**	**bcd**	**bcd**

Tukey HSD test; variable Population density (*Erigeron annuus*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 8065E6, df = 2817.0					
IDPREC	5	6	7	11	all
5		0.140172	0.000036	0.983714	0.498372
6	0.140172		0.309815	0.100687	0.536130
7	0.000036	0.309815		0.000017	0.000019
11	0.983714	0.100687	0.000017		0.186158
all	0.498372	0.536130	0.000019	0.186158	
	a	**ab**	**b**	**a**	**a**

Tukey HSD test; variable Eastness (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.00964, df = 19573.					
IDPREC	5	6	7	11	all
5		0.996372	0.673959	0.218192	0.228580
6	0.996372		0.633726	0.333558	0.342624
7	0.673959	0.633726		0.960670	0.967243
11	0.218192	0.333558	0.960670		0.999408
all	0.228580	0.342624	0.967243	0.999408	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Northness (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.17064, df = 19573.					
IDPREC	5	6	7	11	all
5		0.959567	0.997260	0.803966	0.810960
6	0.959567		0.987822	0.999993	0.999988
7	0.997260	0.987822		0.864512	0.872657
11	0.803966	0.999993	0.864512		0.999940
all	0.810960	0.999988	0.872657	0.999940	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Slope (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 12.230, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.854046	0.005786	0.006801
6	0.000017		0.000017	0.000017	0.000017
7	0.854046	0.000017		0.000017	0.000017
11	0.005786	0.000017	0.000017		0.992178
all	0.006801	0.000017	0.000017	0.992178	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Elevation (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 6787.0, df = 19573.					
IDPREC	5	6	7	11	all
5		0.005776	0.999996	0.000017	0.000017
6	0.005776		0.001543	0.827114	0.868439
7	0.999996	0.001543		0.000017	0.000017
11	0.000017	0.827114	0.000017		0.726537
all	0.000017	0.868439	0.000017	0.726537	
	a	**b**	**a**	**b**	**b**

Tukey HSD test; variable Bio_1 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.86246, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000022	0.000017	0.000017	0.000017
6	0.000022		0.000017	0.000017	0.000017
7	0.000017	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.282792
all	0.000017	0.000017	0.000017	0.282792	
	a	**b**	**c**	**d**	**d**

Tukey HSD test; variable Bio_7 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.2861, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000456	0.000026	0.000017	0.000017
6	0.000456		0.000017	0.000017	0.000017
7	0.000026	0.000017		0.999778	0.998866
11	0.000017	0.000017	0.999778		0.973408
all	0.000017	0.000017	0.998866	0.973408	
	a	**b**	**c**	**c**	**c**

Tukey HSD test; variable Bio_10 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.52500, df = 19573.					
IDPREC	5	6	7	11	all
5		0.009572	0.000017	0.000017	0.000017
6	0.009572		0.000017	0.000017	0.000017
7	0.000017	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.239283
all	0.000017	0.000017	0.000017	0.239283	
	a	**b**	**c**	**d**	**d**

Tukey HSD test; variable Bio_11 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1.9529, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.000017	0.000017	0.000017
6	0.000017		0.000017	0.000017	0.000017
7	0.000017	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.406282
all	0.000017	0.000017	0.000017	0.406282	
	a	**b**	**c**	**d**	**d**

Tukey HSD test; variable Bio_12 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 15078., df = 19573.					
IDPREC	5	6	7	11	all
5		0.043532	0.830538	0.839722	0.836329
6	0.043532		0.166087	0.061540	0.062313
7	0.830538	0.166087		0.996594	0.996947
11	0.839722	0.061540	0.996594		0.999996
all	0.836329	0.062313	0.996947	0.999996	
	a	**b**	**ab**	**ab**	**ab**

Tukey HSD test; variable Bio_17 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 974.44, df = 19573.					
IDPREC	5	6	7	11	all
5		0.837205	0.999999	0.848859	0.855289
6	0.837205		0.807073	0.980217	0.978939
7	0.999999	0.807073		0.657211	0.669724
11	0.848859	0.980217	0.657211		0.999928
all	0.855289	0.978939	0.669724	0.999928	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Bio_18 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 863.95, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.000017	0.000017	0.000017
6	0.000017		0.000017	0.000017	0.000017
7	0.000017	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.235012
all	0.000017	0.000017	0.000017	0.235012	
	a	**b**	**c**	**d**	**d**

Tukey HSD test; variable Distance_roads (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1834E2, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.336752	0.000017	0.000017
6	0.000017		0.000017	0.000017	0.000017
7	0.336752	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.999915
all	0.000017	0.000017	0.000017	0.999915	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Distance_roads_1 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2630E2, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.997594	0.037077	0.035612
6	0.000017		0.000017	0.000017	0.000017
7	0.997594	0.000017		0.005332	0.004968
11	0.037077	0.000017	0.005332		0.999933
all	0.035612	0.000017	0.004968	0.999933	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Distance_roads_2 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1031E2, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	1.000000	0.999296	0.997234
6	0.000017		0.000017	0.000017	0.000017
7	1.000000	0.000017		0.997286	0.989607
11	0.999296	0.000017	0.997286		0.880567
sve	0.997234	0.000017	0.989607	0.880567	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1333E3, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.713218	0.000017	0.000017
6	0.000017		0.000017	0.000017	0.000017
7	0.713218	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.062847
all	0.000017	0.000017	0.000017	0.062847	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Distance_watercourses_1 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1447E3, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.688613	0.000017	0.000017
6	0.000017		0.000017	0.000017	0.000017
7	0.688613	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.065137
all	0.000017	0.000017	0.000017	0.065137	
	a	**b**	**a**	**c**	**c**

Tukey HSD test; variable Distance_watercourses_2 (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1371E3, df = 19573.					
IDPREC	5	6	7	11	all
5		0.000017	0.002047	0.000017	0.000017
6	0.000017		0.000017	0.000017	0.000017
7	0.002047	0.000017		0.000017	0.000017
11	0.000017	0.000017	0.000017		0.085447
all	0.000017	0.000017	0.000017	0.085447	
	a	**b**	**c**	**d**	**d**

Tukey HSD test; variable Population density (*Robinia pseudoacacia*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1002E6, df = 19573.					
IDPREC	5	6	7	11	all
5		0.034009	0.824403	0.000055	0.000075
6	0.034009		0.000846	0.997803	0.995650
7	0.824403	0.000846		0.000017	0.000017
11	0.000055	0.997803	0.000017		0.914786
all	0.000075	0.995650	0.000017	0.914786	
	a	**b**	**a**	**b**	**b**

Tukey HSD test; variable Eastness (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.01231, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.998997	0.086492	0.493250	0.681769
6	0.998997		0.055686	0.354807	0.516857
7	0.086492	0.055686		0.634270	0.298421
11	0.493250	0.354807	0.634270		0.973501
all	0.681769	0.516857	0.298421	0.973501	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Northness (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 0.26779, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.742985	0.005780	0.990298	0.998624
6	0.742985		0.000089	0.872300	0.374664
7	0.005780	0.000089		0.000124	0.000540
11	0.990298	0.872300	0.000124		0.819306
all	0.998624	0.374664	0.000540	0.819306	
	a	**a**	**b**	**a**	**a**

Tukey HSD test; variable Slope (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 18.929, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000018	0.000409	0.207429	0.947364
6	0.000018		0.000017	0.000017	0.000017
7	0.000409	0.000017		0.050731	0.000092
11	0.207429	0.000017	0.050731		0.191706
all	0.947364	0.000017	0.000092	0.191706	
	ab	**d**	**ac**	**abc**	**ab**

Tukey HSD test; variable Elevation (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 28125., df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000025	0.914566	0.899453	0.624670
6	0.000025		0.000017	0.000028	0.000026
7	0.914566	0.000017		0.355699	0.118469
11	0.899453	0.000028	0.355699		0.979247
all	0.624670	0.000026	0.118469	0.979247	
	a	**b**	**a**	**a**	**a**

Tukey HSD test; variable Bio_1 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.9012, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000020	0.002601	0.000070	0.000195
6	0.000020		0.636101	0.519947	0.121261
7	0.002601	0.636101		0.999977	0.980804
11	0.000070	0.519947	0.999977		0.870956
all	0.000195	0.121261	0.980804	0.870956	
	a	**b**	**b**	**b**	**b**

Tukey HSD test; variable Bio_7 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 3.1650, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.817750	0.000018	0.000341	0.003303
6	0.817750		0.000202	0.053697	0.260604
7	0.000018	0.000202		0.110904	0.003491
11	0.000341	0.053697	0.110904		0.669063
all	0.003303	0.260604	0.003491	0.669063	
	ab	**abcd**	**ce**	**bcde**	**bcd**

Tukey HSD test; variable Bio_10 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2.1612, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000019	0.191710	0.001117	0.002578
6	0.000019		0.025496	0.113201	0.012499
7	0.191710	0.025496		0.783078	0.960136
11	0.001117	0.113201	0.783078		0.927715
all	0.002578	0.012499	0.960136	0.927715	
	ac	**bd**	**acde**	**bcde**	**cde**

Tukey HSD test; variable Bio_11 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 5.4164, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000138	0.000039	0.000024	0.000065
6	0.000138		0.996374	0.997113	0.751974
7	0.000039	0.996374		0.939209	0.458540
11	0.000024	0.997113	0.939209		0.759170
all	0.000065	0.751974	0.458540	0.759170	
	a	**b**	**b**	**b**	**b**

Tukey HSD test; variable Bio_12 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 21170., df = 1465.0					
IDPREC	5	6	7	11	all
5		0.275417	0.027535	0.073074	0.571351
6	0.275417		0.000036	0.000035	0.000916
7	0.027535	0.000036		0.879601	0.144883
11	0.073074	0.000035	0.879601		0.353228
all	0.571351	0.000916	0.144883	0.353228	
	acd	**ac**	**bd**	**abd**	**abd**

Tukey HSD test; variable Bio_17 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1365.4, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.723187	0.001387	0.047943	0.296987
6	0.723187		0.000027	0.000482	0.005995
7	0.001387	0.000027		0.379082	0.025630
11	0.047943	0.000482	0.379082		0.589480
all	0.296987	0.005995	0.025630	0.589480	
	abc	**ab**	**de**	**cde**	**acd**

Tukey HSD test; variable Bio_18 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 2333.1, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000046	0.000022	0.000019	0.000032
6	0.000046		0.997272	0.988746	0.658106
7	0.000022	0.997272		0.903108	0.385216
11	0.000019	0.988746	0.903108		0.762400
LL	0.000032	0.658106	0.385216	0.762400	
	a	**b**	**b**	**b**	**b**

Tukey HSD test; variable Distance_roads (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 83222., df = 1465.0					
IDPREC	5	6	7	11	all
5		0.000282	0.810842	0.000018	0.001179
6	0.000282		0.023989	0.999732	0.458793
7	0.810842	0.023989		0.001683	0.169742
11	0.000018	0.999732	0.001683		0.058528
all	0.001179	0.458793	0.169742	0.058528	
	ac	**bd**	**acd**	**bd**	**bcd**

Tukey HSD test; variable Distance_roads_1 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1200E2, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.732589	0.976188	0.019522	0.466305
6	0.732589		0.396371	0.576195	1.000000
7	0.976188	0.396371		0.003242	0.147241
11	0.019522	0.576195	0.003242		0.143222
sve	0.466305	1.000000	0.147241	0.143222	
	a	**ab**	**a**	**b**	**ab**

Tukey HSD test; variable Distance_roads_2 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 64372., df = 1547.0					
IDPREC	5	6	7	11	all
5		1.000000	1.000000	0.756534	0.977125
6	1.000000		1.000000	0.789838	0.981792
7	1.000000	1.000000		0.805853	0.983832
11	0.756534	0.789838	0.805853		0.867721
all	0.977125	0.981792	0.983832	0.867721	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses_1 *(Veronica persica)* Approximate Probabilities for Post Hoc Tests Error: Between MS = 1098E4, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.899247	0.390319	0.975761	0.999985
6	0.899247		0.074779	0.990237	0.835376
7	0.390319	0.074779		0.067938	0.140565
11	0.975761	0.990237	0.067938		0.940613
all	0.999985	0.835376	0.140565	0.940613	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Distance_watercourses_2 (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1167E4, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.922738	0.992494	0.924084	0.987728
6	0.922738		0.740855	0.999799	0.979015
7	0.992494	0.740855		0.701640	0.848850
11	0.924084	0.999799	0.701640		0.981885
all	0.987728	0.979015	0.848850	0.981885	
	a	**a**	**a**	**a**	**a**

Tukey HSD test; variable Population density (*Veronica persica*) Approximate Probabilities for Post Hoc Tests Error: Between MS = 1277E7, df = 1465.0					
IDPREC	5	6	7	11	all
5		0.972264	0.000017	0.833611	0.716094
6	0.972264		0.000017	0.998623	0.281242
7	0.000017	0.000017		0.000017	0.000017
11	0.833611	0.998623	0.000017		0.009794
all	0.716094	0.281242	0.000017	0.009794	
	abc	**abc**	**d**	**ab**	**ac**

CURRICULUM VITAE

Lucija Rajčić was born on August 25, 1996 in Zagreb. She was educated at the Izidor Kršnjavi Elementary School and II Gymnasium in Zagreb. She enrolled in the bachelor's degree programme in Biology at the Faculty of Science, University of Zagreb in 2015 and graduated in 2018 with a Bachelor thesis on "The role of anthocyanins in plant stress response" under the supervision of dr. sc. Mirta Tkalec, Assoc. Prof. In September 2018 she enrolled in the master's degree programme in Ecology and Nature Preservation at the Faculty of Science, University of Zagreb.

Conferences

- *13th Croatian Biological Congress (poster section):*
  Tomašić A., **Rajčić L.**, Marčić Z., Horvatić S., Mustafić P., Zanella D., Ćaleta M., Mrakovčić M., Karlović R. (2018): The growth of white bream (*Blicca bjoerkna L.*) in river Drava reservoirs. Zbornik sažetaka (Hrvatski biološki kongres s međunarodnim sudjelovanjem) (ed. Kružić P.). Hrvatsko biološko društvo, Zagreb.
- *6th Croatian Botanical Symposium (poster section):*
  Bučar M., Justić M., **Rajčić L.**, Rešetnik I. (2019): Analysis and digitalisation of the herbarium of count Franjo Vojković-Vojkffy Klokočki. Book of abstracts – Sixth Croatian Botanical Symposium with international participation (ed. Jasprica N., Car A.). Croatian Botanical Society, Zagreb.
- *NEOBIOTA 2020 - 11th International Conference on Biological Invasions (poster section):*
  Rajčić L., Jelaska S. D. (2020): To what extent spatial precision of chorological data affects our perception of the preferred environmental conditions of invasive species – a case study of *Ailanthus altissima* in Croatia. Book of Abstracts with Programme- 11th International Conference on Biological Invasions (ed. Jelaska S. D.). Croatian Ecological Society, Zagreb.