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An analysis of deer habitat on the Swiss Plateau

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The red deer is a native species but at the beginning of the 20th century has been nearly extinct in Switzerland. Due to an improved protection the numbers of red deer are rising and in the last decades the species has recolonized many parts of Switzerland. The situation of the deer is sensitive. It is therefore important to weight environmental capacities and to manage deer populations in a balanced way. In order to manage deer populations it is first of all necessary to determine the deer's habitat potential which is the main focus of this project.

Currently several methods are used for the determination of deer habitat such as manual counts and mortality statistics. These methods however do not take into account various environmental aspects. We have therefore chosen to use the extended Ueckermann method (Bonney, 1991; Ueckermann, 1952, 1960) for the identification of deer habitat on the Swiss Plateau. This method has never been applied in Switzerland before and it is based on six criteria which are all independently evaluated on the basis of several environmental parameters such as the shape of forest patches or the kind of bedrock. Ueckermann's method yields an estimate of sustainable red deer densities regarding economical value of forests (between 1.5 and 4 deer / 100 hectares).

Several steps were required to apply this method. At first georeferenced datasets were acquired and analyzed in order to identify the data that fitted Ueckermanns criteria. Moreover data precision, reliability, homogeneity, malleability were important measures. Finally four data sets were selected:

The swissTLM3D (swisstopo) a large-scale topographical landscape database of Switzerland which includes land-use data
The geological 1:500'000 atlas of Switzerland (swisstopo)
Forest data from the cantons of Vaud (dendrometric data) and Fribourg (surfaces)

These data sets were used to implement a data analysis process in order to apply the extended Ueckermann method. Each criterion was processed independently and some hypothesis were established with the help of specialists. (Figure 1) In order to identify forest patches for instance, minimum dimensions had to be taken into account: A minimum distance of 100 meters that could fit in a surface of at least 25 hectares.

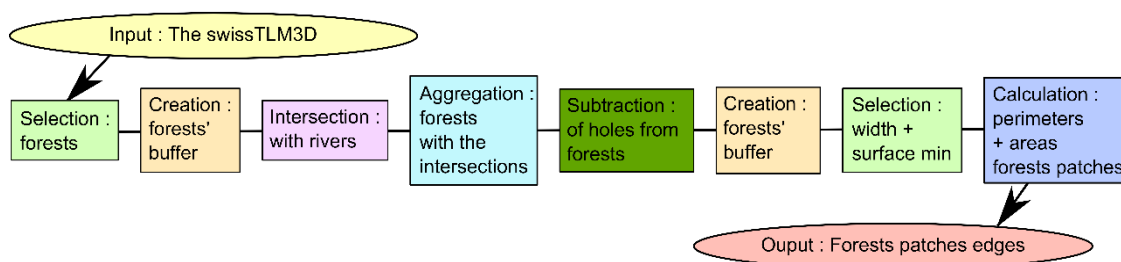


Figure 1. Example of processing steps of one criterion of the extended Ueckermann method.

Moreover as the trees' height information which is taken into consideration for an another criterion was missing, it had to be determined using other information such as the stage of forest development, the degree of closure, planned forest management and the availability of hardwood.

The main result of the data analysis is a synthetic map showing forest areas on the Swiss Plateau and highlighting potential deer habitat. For each habitat Ueckermanns criteria and points are specified (Figure 2). Although it is still necessary at this stage to control the results and to present them to forest and wildlife experts, this study demonstrated the applicability of Ueckermanns extended method on western Switzerland, despite the difficulty of merging together heterogeneous datasets. All generated data enables stakeholders to take decisions for the protection of this habitat and allows for a comparison with other data sets such as for instance deer observations.

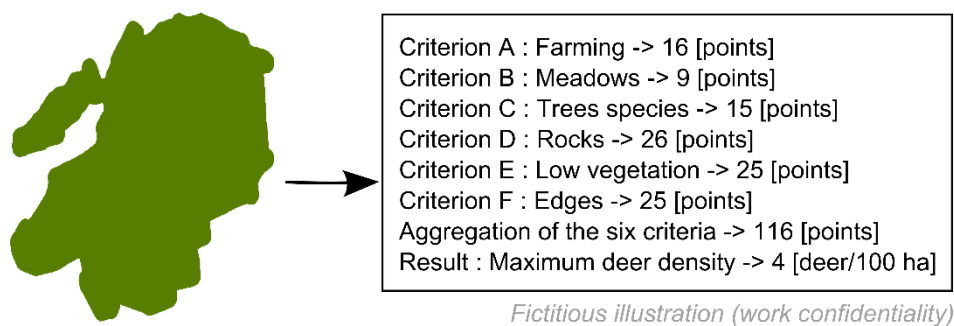


Figure 2. Illustration of a forest patch with different calculated criteria.

This study demonstrated the applicability of Ueckermanns extended method on Swiss data. However a main difficulty in the processing of data was the heterogeneity of data coming from the Swiss state and different cantons which can lead to potential inconsistencies. The approach that the authors have taken in order to apply Ueckermanns extended method can be used for the analysis of other species' habitat.

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iDigBio vs. FOSSIL? Closing the gap and franking private fossil resources into professional databases.

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The great natural history collections in museums, universities and other academic institutions all over the world are the backbone of national and international research in taxonomy, biodiversity and evolution. But getting access to those resources is mostly limited to academics. The main goal of the Integrated Digitized Biocollections project, in short iDigBio, is to collect data and images for millions of biological specimens and make them available in electronic format for the research community, government agencies, students, educators, and the general public. It is the National Resource for Advancing Digitization of Biodiversity Collections (ADBC) funded by the National Science Foundation (NSF). The bulk of the collections, especially for fossils, has its origin in private engagement and was donated by private collectors and enthusiasts. Even the most iconic of fossils (e.g. *Archaeopteryx lithographica*, von Meyer 1861) stem from the playground of amateur paleontologists and private collectors. It is hard to imagine how much more may lie dormant unnoticed in private cabinets. The NSF funded FOSSIL project is focused on getting access to these treasures in building connections in the paleontological community. It is the core of a big network between amateurs and professionals. How can iDigBio and FOSSIL get along? While iDigBio is the big online collection for the bio-community, FOSSIL is part of this community. It helps the paleo-people getting together, communicate in a simple form and tear down borders between the academics and the public. It is focused on attracting fossil hunters of all ages and level of experience to participate in academic research in general and to provide professional digital databases like myFOSSIL and iDigBio with input that was recently mostly unreachable. To that end, the Fossil Project in partnership with iDigBio has begun training amateurs to fulfill all the requirements needed to not just get access into the databases but also to be part of the FOSSIL and iDigBio world in donating their treasures in digital form. As amateurs gain skills, we anticipate increased interest and participation in the international effort to digitize collections.