

EBONE



European Biodiversity Observation Network: Design of a plan for an integrated biodiversity observing system in space and time

Variables in Environmental Monitoring Enables a Multitude of Classifications **-A Way to Incorporate Inventory Data from National Programs into Harmonization Efforts**

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Universitatea din București

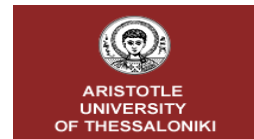


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-A Way to Incorporate Inventory Data from National Programs into Harmonization Efforts

Anna Allard

Corresponding author: Landscape Analysis, NILS – National Inventory of Landscapes in Sweden, SLU, Umea, SE-90183, SWEDEN (anna.allard@slu.se)

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Introduction

An old dilemma for monitoring endeavours is the comparability between different classification systems. Classification is important, as it is the means of communication between the individual level and the group level. Every nation, or even group of scientists, uses their definition of classes and which components of the environment they contain – which is readily visible across two maps. Many attempts at harmonization have been made, in the Nordic countries, in Europe as well as across the Atlantic, for instance the Natura 2000 Network by the European Commission, or the General Habitat Categories from the EBONE Project.

Inventory in the Swedish NILS program

The National Inventory of Landscapes in Sweden (NILS) started in 2003 in answer to the demands of monitoring information for the Swedish Environmental Protection Agency, which also commissioned the program from the Swedish University for Agriculture, SLU in Umeå. NILS includes structural and functional attributes of different spatial and temporal scales and gathers environmental data in a strategic sample scheme nationwide, figure 1. The layout is 631 permanent squares in 10 different strata, based on the regions in the rural statistics and the biogeographical regions and during five years all are inventoried in a revolving system. There are two parallel inventories combined, one by field, which produces histograms and tables, figure 2, the other by interpretation of infrared aerial photos. The CIR aerial photos are interpreted in stereo, with recurring calibration and thematic education of the staff, figure 3. The data is stored in a geodatabase and generate possibilities for spatiotemporal analysis of status and changes of the landscape, taking into account the actual land use and impact in the landscape.

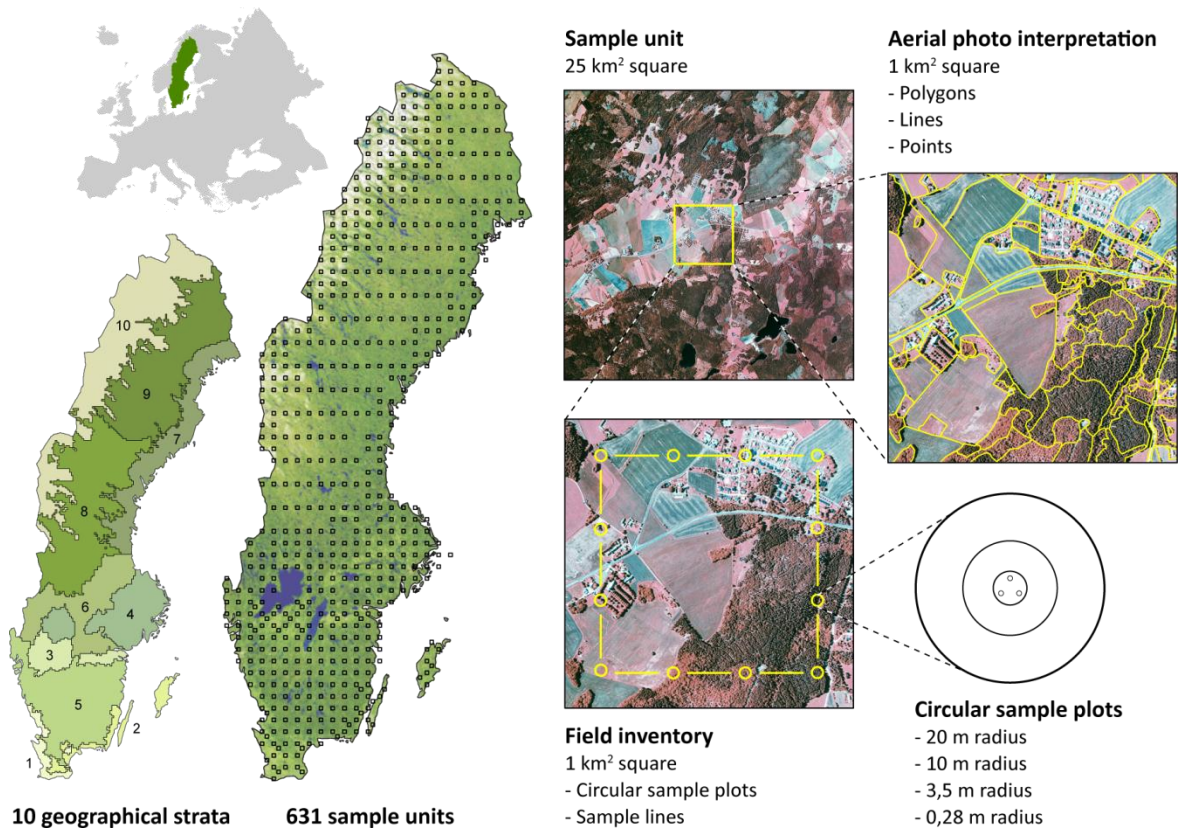


Figure 1. The design scheme and the layout of the program, National Inventory of Landscapes in Sweden, NILS.



Figure 2. Examples of the Field inventory in the NILS program, where 12 sample plots in each square is inventoried in detail, registering up to 240 variables. Not shown here is the second type of inventory, the line intersect sampling, where all linear objects crossing 12 lines of 200 m each is registered and inventoried in a scheme of variables. The field

inventory data can be analysed as one inventory, or the data can be co-analysed with the data from the aerial photo inventory.

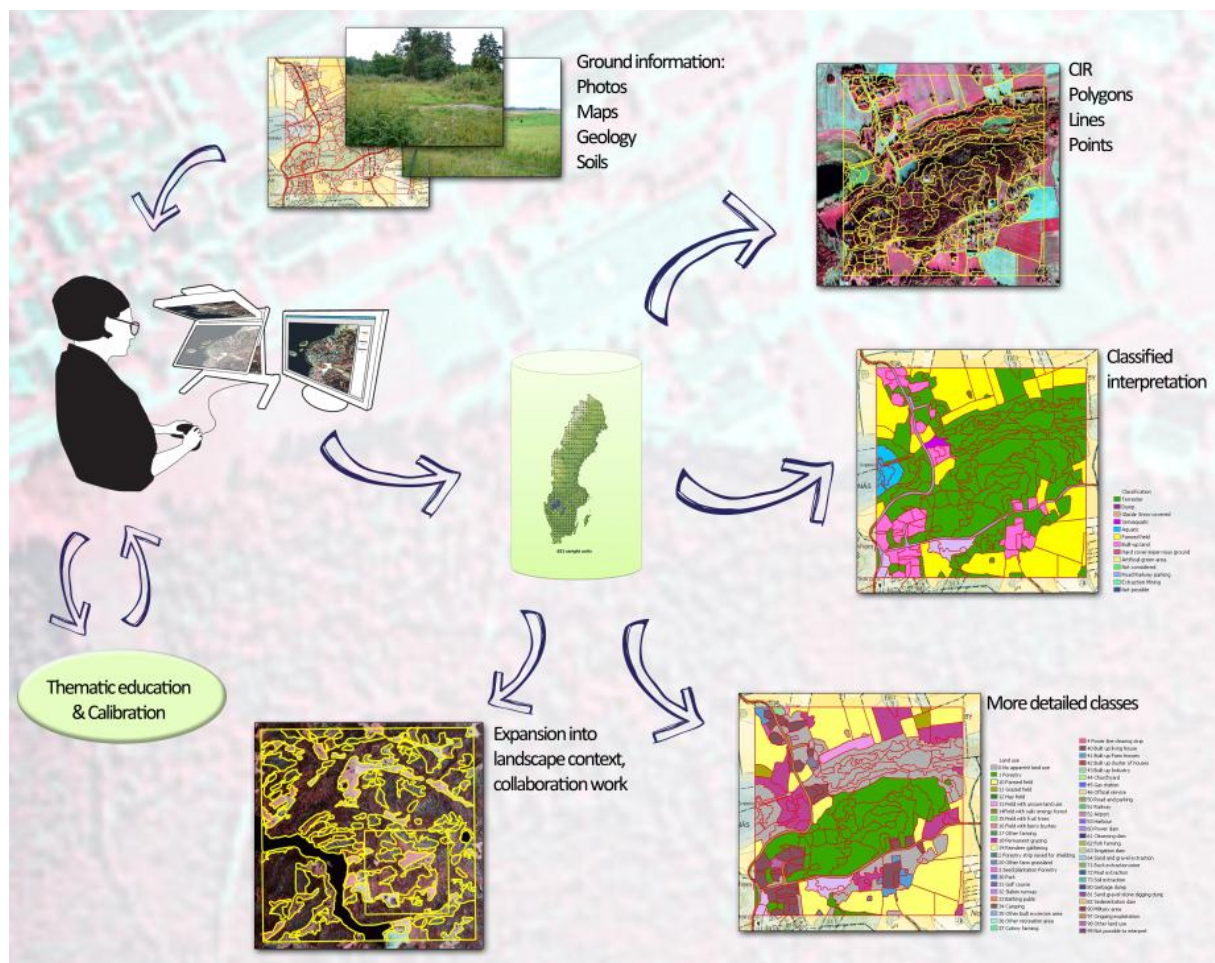


Figure 3. The process of data gathering and by colour infrared aerial photos in stereo view in the NILS program. From the geographical data covering one full rotation of samples, different types of classification systems can be assembled and the same set of data can be analysed according to different research questions.

Variables, not predefined classes

The NILS program uses variables to describe the landscape. In total 87 variables in the CIR aerial photos and around 270 in the field inventory, with up to 44 subclasses are collected. The aerial data is collected in polygons, lines and point objects. Some variables are in percentage of cover, others are in height (meters), and others again have a set of subclasses that vary. The field data is collected in sample plots and as line intersect samples. From these, the classification can be assembled, using the same web of polygons, lines and points.

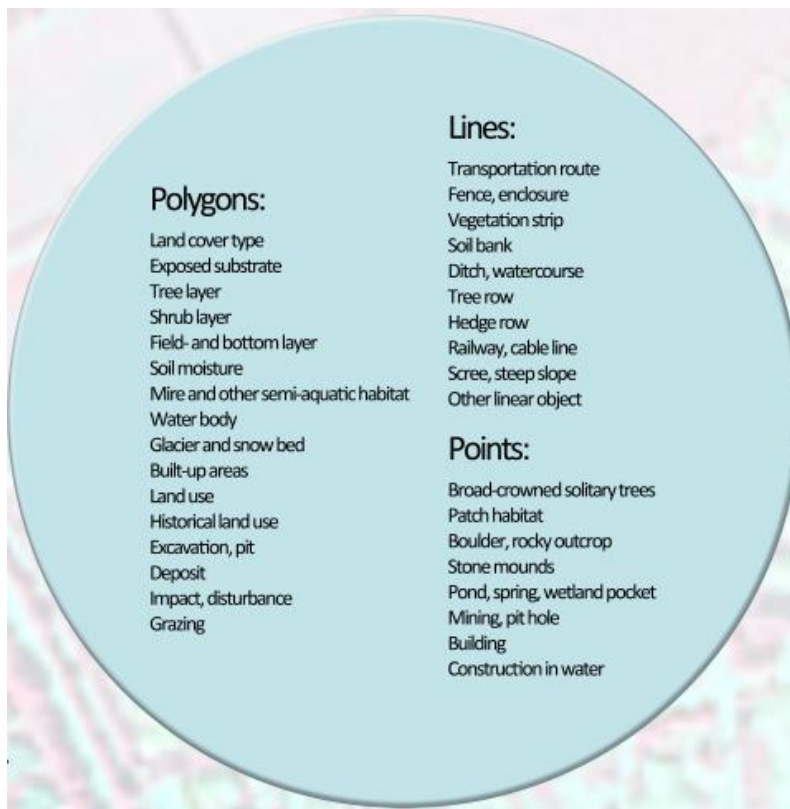


Figure 4. Examples from the main variable groups inventoried in the colour infrared aerial photos.

Conversion to predefined classes

The use of a large and comprehensive set of variables in different scales, enable the conformation into many different classifications systems. The inventory by infrared aerial photos also gives the landscape context to the variables. The NILS program will be using a standard classification scheme for results, analyses of status and changes, based on the Norwegian nature types. The first real try has also been made to convert into a harmonization system, using the General Habitat Categories, and for many of the hierarchical levels of these categories the pre-inventoried NILS variables can conform. Conversion programs can be used to report the monitoring data of Sweden, tailored into different systems of the world.

A way to incorporate National programs into European harmonization efforts

The challenge facing the national programs, such as Sweden, Norway and the UK, is that the point grid sample of the layout, is statistical and coordinates must remain widely unknown. The risk of different management by landowners or by authorities in these squares is obvious, and extrapolation of these point grids to the status the entire nation will give a false picture. Several ways might be possible to still participate in harmonization efforts. One way is for the harmonisation projects to allow the publication of the data without the actual coordinates. Either as single squares or extrapolated as regions, for example see figure 5.

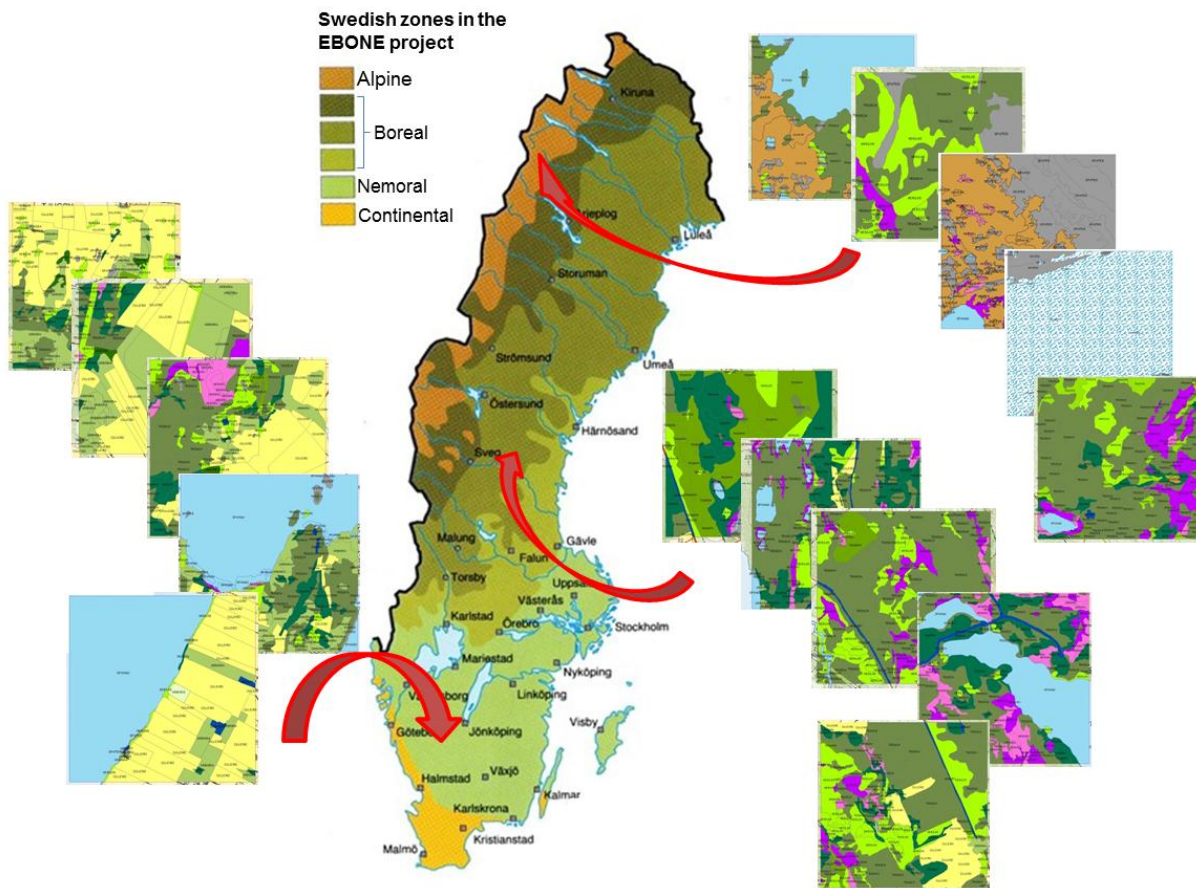


Figure 5. Examples from the conversion of sample plots of the national NILS program into the EBONE classification system, General Habitat Categories. The collective data can then represent the different strata or zones chosen in the European program. In this way the already recorded data can be used for harmonization efforts, while the policy of hidden coordinates of the program can be upheld.

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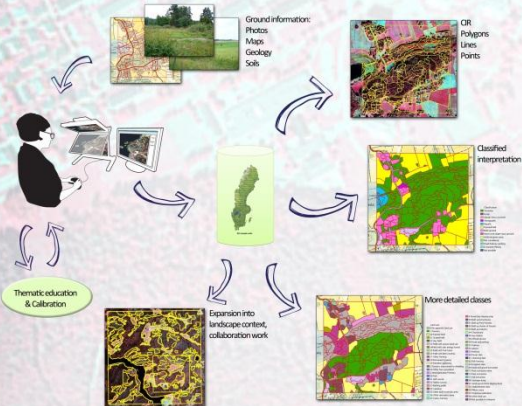
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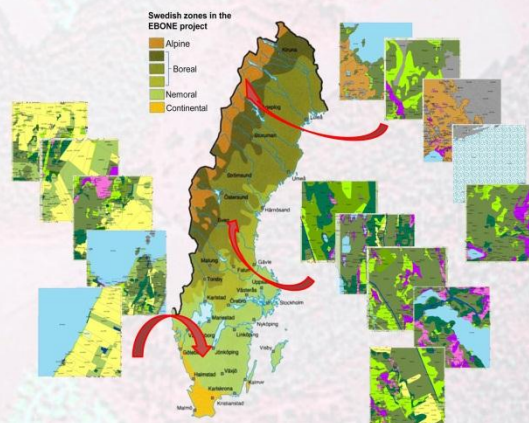


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