MAPPING OF HNV FARMLAND IN SERBIA

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SEPA was founded in November 2004 within the Ministry of Environment and Spatial Planning.

Agency is managed by the director, currently it has 29 employees and consists of 3 departments and 1 group.

Agency’s main tasks are to collect and integrate environmental data, to develop an information system for environmental protection, to create reports on the state of the environment and to cooperate with European Environmental Agency.
SEPA’s publications

Serbian EPA prepares National report on the state of the Environment on the annual level. Reports 2003 - 2009 are available at the Web site of the Agency (Serbian language only).

The reports are delivered to the government of Serbia thus being one of the main documents for policy creation in this field.

www.sepa.gov.rs
Organizations involved in mapping:

- Environmental protection Agency
- Faculty of Agriculture
- Institute for nature conservation of Serbia
- GIS experts
- Ministry of Agriculture, Forestry and Water Management
- Ministry of Environment and Spatial Planning
Serbia is characterized by high plant diversity containing:

• about 40% of all European plant species,

• there is total of 3662 plant species and subspecies of 766 genera and 141 plant families (Stevanović et al., 1995),

• Natural and semi-natural grasslands of Serbia represent one of the major resources in agriculture and key HNV farmland since they are the main resources of the total plant diversity (alpha diversity) and endemic species.

• More than 60% of endemics of Serbia grow on grasslands, (Dajic Stevanovic et al., 2010).
Methodology and criteria for evaluation and mapping of HNV farmland in Serbia was developed using the following sources:

- List of the Habitat Directive Annex I. habitats depending on agricultural practices
- Final Report of Workshop on High Nature Value farming in the Western Balkans HNV farmland, 2006, Belgrade (UNEP, WWF et al)
- Draft minutes of EEA expert meeting on High Nature Value farmland, 2006
- Corine Land Cover
- Guidance document to the member states on the application of HNV impact indicator, 2008 (EEN for Rural Development)
- Habitats of Serbia – The results of Project Harmonization of national nomenclature in habitat classification with international standards, 2005, Faculty of Biology, University of Belgrade (ed. D. Lakusic)
- Phyto-geographical affiliation, distribution and centers of diversity of Balkan’s endemic flora in Serbia. PhD thesis by G. Tomovic, 2007, Faculty of Biology, University of Belgrade
The following sources of data for High Nature Value (HNV) Farmland mapping in Serbia were used:

- **CORINE 2006 Land Cover Classes.**
- **Protected Areas (PA).** Boundaries of Protected areas were provided by the Institute for nature conservation of Serbia.
- **Important Bird Areas (IBA).** Boundaries of Important Bird Areas were provided by the Institute for nature conservation of Serbia.
- **Prime Butterfly Areas (PBA).** Boundaries of Prime Butterfly areas were provided by the Institute for nature conservation of Serbia.
- **Important Plant Areas (IPA).** Data on Important Plant Areas were provided by the Institute for nature conservation of Serbia.
- **Habitats (H).** Descriptive files for Habitat sites were provided by the Agricultural Faculty of Belgrade.
Mapping of High Nature Value (HNV) Farmland in Serbia was carried out in several steps:

1) Selection of relevant CORINA land cover classes in Serbia

2) Transformation vector data into a national coordinate system

3) Mapping of IPA, PBA, PA and IBA areas

4) Mapping of Habitat areas

5) Creation the overlapping layers

6) Calculation of the HNV farmland area and cartographic processing
Data on CORINA categories, IBA, PBA and PA areas were available in vector form and they were transformed into the national coordinate system.

Data on the IPA areas are mapped based on the approximate position and surface area data. On the basis of topographic maps and protected areas data the mapping of these areas has been done.

In a similar way was performed Habitat mapping layer.
The following CORINA classes were selected:
211, 221, 222, 231, 242, 243, 321, 324, 333, 411

Classes are allocated for the entire area of Serbia and divided into two groups.

First group consists of the following codes:
231-Pastures,
321-Natural grasslands,
411-Inland Marshes
The second group consists of the classes with the following codes:

211-Non-irrigated arable land,
221-Vineyards,
222-Fruit trees and berry plantations,
242-Complex cultivation patterns,
243-Land principally occupied by agriculture, with significant areas of natural vegetation,
324-Transitional woodland-shrub,
333-Sparsely vegetated
The overlapping layers with HNV areas were performed:

- CORINA areas that belong to classes with the following codes 231, 321 and 411

- Areas that belong to CORINA classes from second group (codes 211, 221, 222, 242, 243, 324, 333) and that are located in one of the IPA, PA, IBA, PBA or H layers.

We were using symbolization defined in the CORINA methodology.
The approximate area of HNV farmland in Serbia

<table>
<thead>
<tr>
<th>Description</th>
<th>ha</th>
<th>km²</th>
<th>% of the total agricultural area</th>
<th>% of the total territory of Serbia</th>
</tr>
</thead>
<tbody>
<tr>
<td>The approximate area of HNV farmland in Serbia</td>
<td>1187220</td>
<td>11872.2</td>
<td>18.71%</td>
<td>13.44%</td>
</tr>
<tr>
<td>The total agricultural area in Serbia</td>
<td>6346671</td>
<td>63466.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total territory of Serbia</td>
<td>8836100</td>
<td>88361</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Plant association</td>
<td>Size and number of species</td>
<td>Comment</td>
<td>Description of Land use</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------</td>
<td>---------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Dveča vane</td>
<td>Sequoia sempervirens</td>
<td>172 trees</td>
<td>Zeleni, breza, lipa</td>
<td>50-120 m, breza, lipa, obojavlji, muge</td>
</tr>
<tr>
<td>Majna sivka</td>
<td>Ulexus eximius</td>
<td>76 trees</td>
<td>Veličko rogostanje</td>
<td>800-1100 m, breza, lipa</td>
</tr>
<tr>
<td>Brežička</td>
<td>Ulexus eximius + narodni</td>
<td>100 trees</td>
<td>U brdo</td>
<td>Koteševsko, Grosačite, muge, muge</td>
</tr>
<tr>
<td>Fore planina</td>
<td>Potentilla × crocea</td>
<td>15.5 plants</td>
<td>Zeleni rođak</td>
<td>Koteševsko, Grosačite, muge, muge</td>
</tr>
</tbody>
</table>
CLC categories do not include all possible NHV farmland territory.

- The correction of certain areas was made according to the digital data.
- *Lack* of information regarding proper *GPS coordinates* for some sites disable entry of all sites that are listed in the literature in the process of mapping.
Thank you!