Interim Report

For period:
from September to December 2012

Project title: "Sustainable use and management of halophytic grasslands as key element for biodiversity conservation**"**

Application ID: 9636-1

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The project participants:

Prof. Zora Dajić Stevanović, Chief of Botany Department at Faculty of Agriculture University of Belgrade (PhD in ecology of halophytes; post-doc in salinity tolerance in plants, IUCN and FAO expert in plant conservation, mainly of medicinal plants. She will be mainly involved in providing her experience in conservation and sustainable use of halophytic grasslands)

Svetlana Aćić (PhD student at the Faculty of Agriculture, University of Belgrade, PhD in grassland vegetation)

Ivan Šoštarić (PhD student at the Faculty of Biology, University of Belgrade, PhD in medicinal plants)

INTRODUCTION:

Halophytic vegetation is primarily common for arid and semi-arid regions of the world, but it could be found in all climates areas and at different altitudes. On the territory of the Republic of Serbia these habitats are mosaic spread as intrazonal ecosystems type, primarily in the Province of Vojvodina (over 250,000 hectares), where acute saline soil - solonchaks occupy about 20,000 hectares, which seems about 1% of the province, while a smaller percentage of occupied saline are from Southern Serbia. Saline biotopes are recognized as internationally important habitats for specific flora and fauna, which provides qualitative characteristics of their biodiversity (EU Habitat Directive). Saline habitats are on the list of priority habitats under the EU Directive 92/42/EEC (Wallis De Vries, 2002). The main characteristic of these ecosystems and habitats gives halophytic flora and vegetation as an indicator of specific conditions, first of all, the content and composition of salt in soil.

Saline habitats have great importance, both for the conservation of biodiversity, as well as a resource in agriculture, because most are used as pastures, as well as the habitat of species with medicinal properties of wild relatives of cultivated plants, which are of great importance in biotechnology, in terms of the sources of genes for resistance to salt stress.

In Republic of Serbia there are only two protected saline areas: SNR "Slano Kopovo" and "Pasnjaci velike droplje". Saline habitat conservation is of great importance, not only in terms of biodiversity, due to the presence of rare, endangered and endemic plant and animal species, primarily those specially adapted to conditions of increased salt levels in the soil, but also for the local people who use these resources primarily in animal husbandry, i.e. as pasture. Proper utilization of halophytic pastures not fully understood or evaluated.

Realization of the Project activities will contribute to understanding of importance of conservation of halophytic grasslands since they are natural habitats enabling occurrence of very specific flora, including rare, endangered and endemic species. The on the other hand, survey on main soil features in relation to certain floristic composition and vegetation types will allow a setting up of the general soil “bioindication” , i.e. using flora as a tool for determination of soil salinity level. This is of high practical importance, as is much cheaper way of recognition of the soil salinity, as key factor preventing growing of most crops.

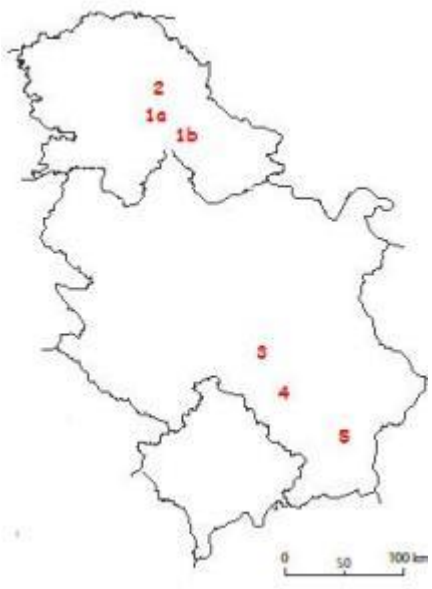
Screening of the presence of medicinal and aromatic plants could contribute to sustainable use of these grasslands (apart of grazing), in term of wild collecting at small scale.

The project activities that we realised in the first phase for period from September to December 2012. included:

1. Review of available literature data concerning the saline habitats in Serbia – so far some of these habitats were analyzed, most in term of flora and vegetation, while soil features and presence of medicinal herbs was not much studied

2. Selection of sites for fieldwork studies – upon review of available data and pedological maps, target halophytic grasslands have selected; special attention was paid on so far unexamined habitats. We have selected 3-5 most interesting sites, most likely located in geographically distant areas of the country (e.g. on the north and on the southeast of Serbia)

   At the Province of Vojvodina we selected area around Melenci (Rusanda and Okanj bara) and Slano Kopovo. And at the south of Serbia we have deciced for 3 sites: Lalinacka slatina, Oblacinsko jezero and Bresnicic.



Map of the fieldwork sites

3. Field research included both analyses of flora and vegetation in autumn aspect at the selected sites. Flora determined upon botanical keys (e.g. Flora of Serbia, Flora Europea), whereas the vegetation recorded using phyto-sociological method of Braun-Blanquet. The rare, endangered and endemic species will be evaluated upon the Serbian Red Book of Flora in the next stage of project.

FIELD SURVEY RESULTS:

These 5 sites were surveyed during the September 2012. Inventory and monitoring of halophytic flora and vegetation have been done in five days fieldwork.

List of diagnostic halophytic species:

1a. Rusanda: *Artemisia santonicum*, *Aster sedifolius* subsp. *sedifolius*, *Aster tripolium* subsp. *pannonicus*, *Bassia prostrata*, *Bassia sedoides, Beckmannia eruciformis*, *Crypsis aculeata*, *Euclidium syriacum*, *Heliotropium supinum*, *Limonium gmelinii* subsp. *hungaricum*, *Lythrum tribracteatum*, *Pholiurus pannonicus*, *Plantago schwarzenbergiana*, *Plantago tenuiflora*, *Salicornia europaea*, *Scilla autumnalis*, *Scirpus lacustris* subsp. *tabernaemontani*, *Scorzonera parviflora*, *Silene viscosa*, *Suaeda maritima*, *Suaeda pannonica*

1b. Okanj bara: *Achillea pannonica*, *Agrostis stolonifera*, *Aster tripolium* subsp. *Pannonicus, Carex otrubae*, *Cirsium arvense*, *Consolida orientalis*, *Gypsophila muralis*, *Juncus compressus*, *Juncus effusus*, *Lepidium ruderale*, *Lythrum virgatum*, *Oenanthe silaifolia*, *Plantago schwarzenbergiana*, *Scirpus lacustris*, *Scirpus maritimus, Scorzonera cana*, *Stachys palustris*, *Mentha aquatica, Plantago lanceolata*, *Poa trivialis*, *Potentilla argentea, Puccinellia limosa*

2. Slano kopovo: *Salicornia europaea, Suaeda pannonica, Suaeda maritime, Plantago schwarzenbergiana, Aster pannonicus (A. tripolium subsp. pannonicus), Scilla autumnalis, Kochia prostrate, Crypsis aculeate, Spergularia media, Sonchus palustris, Puccinellia limosa, Artemisia maritime subsp. Monogyna, Statice gmelini (Limonium g.), Camphorosma annua*

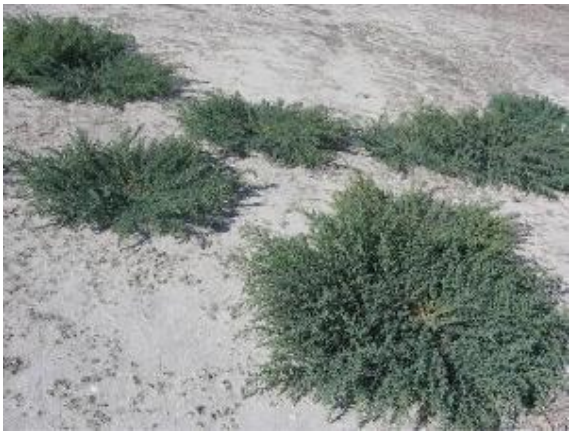
3. Bresnicic: *Lepidium draba, Salvia nemorosa, Lathyrus tuberosus, Centaurea solsticialis, Lactuca seriola Xheranthemum annuum, Achillea nobilis, Bromus commutatus, Polygonum aviculare, Agropyron repens Epilobium adantum, Inula britanica, Sanquisorba minor, Melilotus officinalis, Anagalis arvensis, Egilops cilindrica, Matricaria chamomila, Bromus commutatus, Lothus corniculatus, Trifolium patens, Carex distans, Bolboschenus maritimus, Juncus bufonius, Juncus compressus, Carex sp.*

4. Lalinacka slatina: *Sonchus asper, Trifolium lappaceum, Rumex patientia, Statice gemlinii, Bromus commutatus, Matricaria chamomile, Scorzonera cana, Atriplex hastate, Lepidium perfoliatum Bolboschoenus maritimus, Achillea critmifolia, Puccinellia limosa, Ornithogalum pyramidale, Muscari comosum, Camphorosma monspeliaca, Lactuca viminea, Pholiurus pannonicus, Picris echinoides, Agrostis alba,*

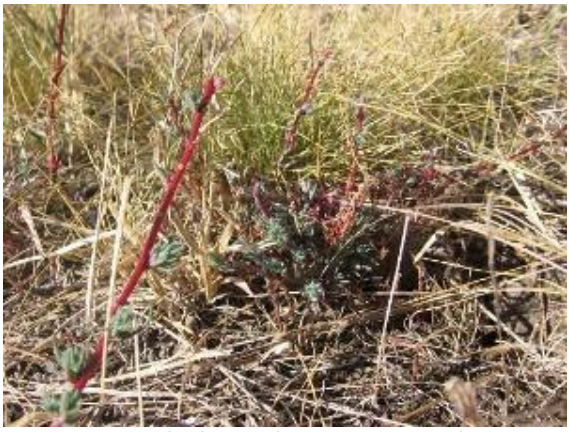
Stachys annua, Camphorosma monspeliaca, Juncus compressus, Carex divisa, Alopecurus pratensis Xheranthemum annuum, Alopecurus myosuroides, Bromus squarosus, Hordeum hystix, Centaurea solsticialis

5. Oblacinsko jezero: *Bromus commutatus, Lolium perene, Festuca pseudovina, Lothus corniculatus, Achillea nobilis, Plantago lanceolata, Galium verum, Helminthia echioides, Scorzonera cana, Festuca valesiaca, Euphorbia falcate, Egylops cilindrica, Trifolium patens, Sanguisorba minor, Lepidium perfoliatum, Elymus asper, Agropyrum cristatus, Lolium perene, Agrostis alba, Atriplex tataricum, Medicago falcate, Gypsophila muralis, Polygonum lapathifolium, Camphorosma annua, Matricaria chamomile, Polygonum aviculare Bolboschoenus maritimum, Picris hispidisima, Inula Britannica, Roripa silvestris, Salvia aetiopis, Trifolium vesiculosum, Trifolium incarnatum*

*1a. Rusanda (Halophytic pasture)**

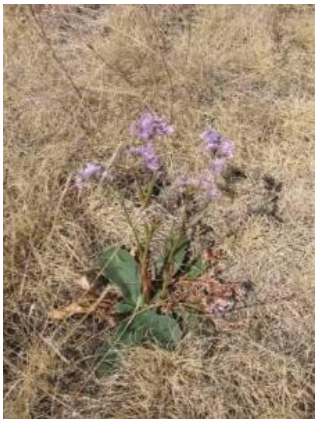


*1a. Rusanda (Suaeda maritime)**

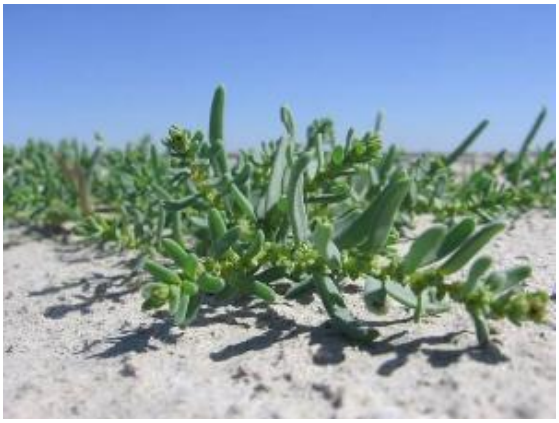


*1a. Rusanda (Camphorosma annua)**

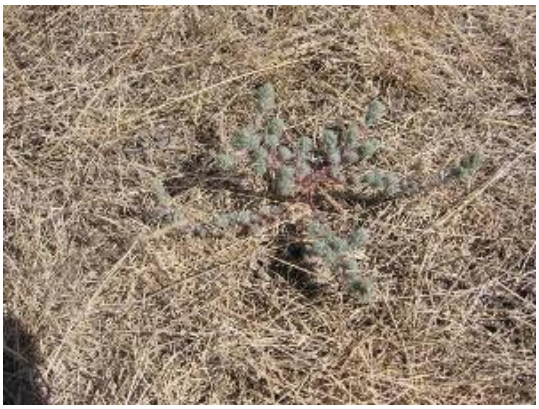
*1a. Okanj bara (Puccinellietum)**



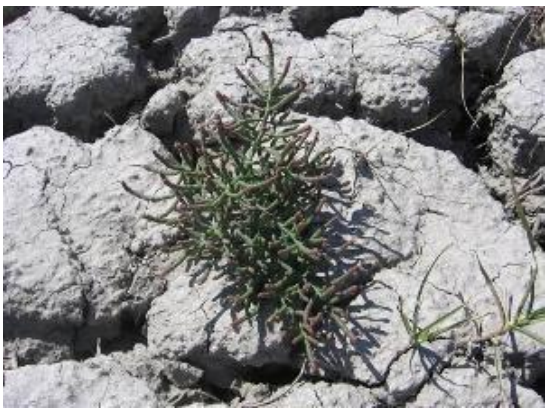
*2. Slano kopovo(Statice gmelinii)**



*2. Slano kopovo (Suaeda maritime)**



*2. Slano kopovo (Camphorosma annua)**



*2. Slano kopovo (Salicornia europaea)**

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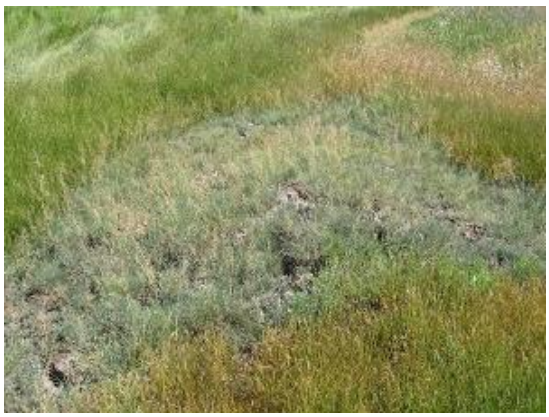
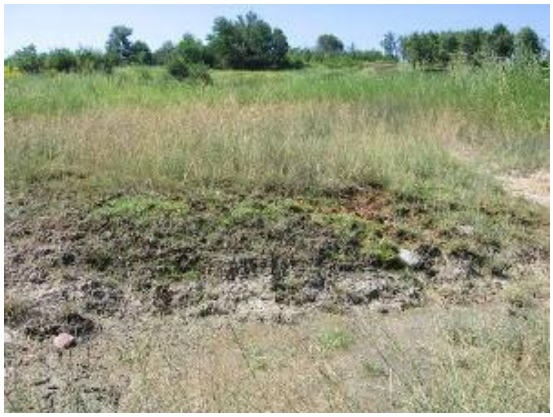
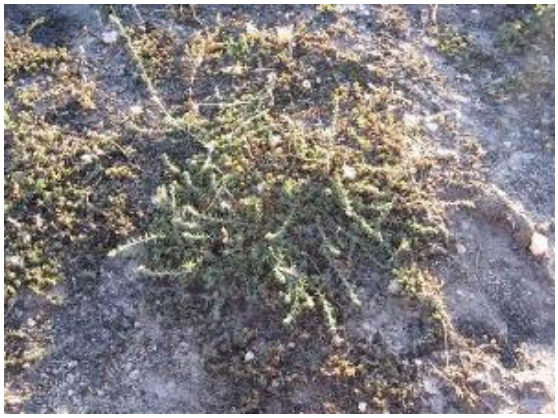
*2. Slano kopovo (Crypsis aculeate)**



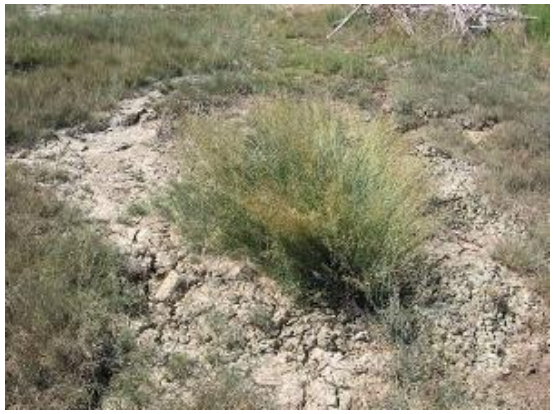
*3. Bresnicic (Puccinellia limosa)**



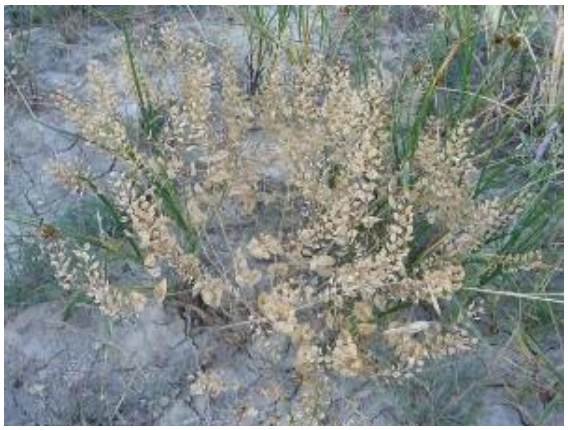
*3. Bresnicic**



*4. Lalinacka slatina (Camphorosma monspeliaca)**



*4. Lalinacka slatina (Puccinellia limosa)**



5. Oblacinsko jezero (Lepidium perfoliatum) [*]

*5. Oblacinsko jezero- fieldwork**

4. During the field work, the soil samples will be collected for laboratory analyses. Estimation of medicinal and aromatic plants will be performed upon the list of MAP for Serbia (e.g. monograph: “Medicinal plants of Serbia” published by Serbian Academy of Science)

CONCLUSION:

The key outcomes of the work are related to assessment of biodiversity of flora and vegetation of selected saline habitats in Serbia, out of some have been surveyed for the first time. The results of our autumn field survey and the preliminary findings of halophytic flora and vegetation will be presented and discussed in the next stage of the project in publication. Interesting findings in this stage was that we didn’t note species *Salsola soda L.,* which was saw last time several years ago. There is no data in last 3 years that this species appears in relevant sites. Thus the first half of our studies has shown on critical situation with this important type of habitat. The most urgent conservation measurements and recommendation for sustainable use have to be established as well as education program among locals. We are planning to continue the field researchers in May and June 2013. at the same site and to overview spring/summer aspects of flora and vegetation. In the meanwhile we will finish laboratory soil analyzes and preparing publication.

[*] *Author of photography’s is Milica Petrovic*