CHANGES IN THE LAND COVER INSIDE THE NATURA 2000 SITES IN OLTENIA SW DEVELOPMENT REGION

Laurian Mugurel Gheorghe
University of Bucharest, mugurgh@yahoo.com

Abstract. The Oltenia SW Development Region has 29,212 square kilometers and 2,300,000 habitants. The diversity of the relief, but also the climatic and soil conditions explain the existence of a very important natural capital which is very often exposed to human pressure. In order to respect the provisions of the community directives, the Romanian Government designated the Natura 2000 sites for the protection of the most important community species and habitats. The aim of this paper is to present the land cover changes, after 1990, in the Oltenia's Natura 2000 sites. Although the sites were designated in 2007, so they didn't exist in 1990, the results of this paper are only a first step of a more complex process which is aimed to analyze if the designation of the Natura 2000 sites and the management measures will have any impact on the land use in Oltenia Region.

Keywords: *land cover changes, Natura 2000, protected areas, SCI, SPA*

Introduction

The SW Development Region is composed by 5 counties and covers 29,192 square kilometers. The region is characterized by a high diversity of the relief, but also by a variety of the pedo-climatic conditions which have induced the existence of a very important natural capital. The protection of this capital is essential in order to insure the providing of ecosystems services for the present and future generations.

One way to protect the important natural capital of the SW Region is by designating Natura 2000 sites. From the whole surface covered by Natura 2000 sites in Romania, an important percentage (over 14%) is located in the SW Region. The Natura 2000 sites are very sensitive areas from biodiversity point of view and the

land use can affect positively or negatively the conservation status of the habitates and/or species.

Some studies concerning the spatial impact of the designation of the Natura 2000 sites on the land cover use in the EU were conducted by the BIOPRESS project (Mucher et al., 2006), but there are also some preoccupations for this issue in the Netherlands (Hazeu et al., 2005)

The Natura 2000 network designation in Oltenia Region

The Natura 2000 sites in Oltenia Region is composed by sites of community importance (SCI) designated for the protections of the natural habitats, plant species

and animal species, other than birds, in accordance with the provisions of the Habitats Directive (Directive 92/43/EEC) and special protection areas, designated for the protection of birds species as the Birds Directive (Directive 2009/147/EEC) requires.

The sites were designated in 2007 by the Ministry of Environment (the SCI's) and the Government (the SPA's). 28 sites of community importance were designated in the whole Oltenia Region, covering 17% of the region's surface. Only 14 SPA's were designated and they are covering 10% of Oltenia's surface. The whole Natura 2000 network covers over 6000 km^2, which represents 21% of the SW Region. This percentage is higher than the national average (aprox. 18%). With this percentage, the SW Region is on the third place among the other development regions: 31% in the Central Region, 27% in the SE Region, 17% in the W Region, 16% in NW Region, 9% in S Region, 5.5% in NE Region and, finally, aprox. 5% in Bucureşti Region (Gheorghe, 2010)

The list of the Natura 2000 sites from Oltenia Region is presented in the table below (see also fig. 1).

Table 1. The Natura 2000 sites in Oltenia SW Development Region

Nr. crt	Site code	Site name	Surface (ha)*	Site type
1	ROSPA0010	Bistreț	1 915,6	SPA
2	ROSPA0011	Blahnița	45 286,3	SPA
3	ROSPA0013	Calafat – Ciuperceni - Dunăre	29 024,3	SPA
4	ROSPA0023	Confluența Jiu - Dunăre	21 999,9	SPA
5	ROSPA0024	Confluența Olt – Dunăre	21 285,4	SPA
6	ROSPA0025	Cozia – Buila – Vânturarița	21 769	SPA
7	ROSPA0026	Cursul Dunării – Baziaș - Porțile de Fier	10 120,4	SPA
8	ROSPA0035	Domogled – Valea Cernei	61 191,5	SPA
9	ROSPA0043	Frumoasa	131 182	SPA
10	ROSPA0046	Gruia – Gârla Mare	2 756,2	SPA
11	ROSPA0074	Maglavit	3 562,6	SPA
12	ROSPA0080	Munț ii Almăjului – Locvei	118 141,6	SPA
13	ROSPA0084	Munții Retezat	38 009	SPA
14	ROSPA0106	Valea Oltului Inferior	54 074,8	SPA
15	ROSCI0015	Buila – Vânturarița	4490,10	SCI
16	ROSCI0039	Ciuperceni - Desa	40852,60	SCI
17	ROSCI0044	Corabia – Turnu Măgurele	7023,60	SCI
18	ROSCI0045	Coridorul Jiului	71393,50	SCI
19	ROSCI0046	Cozia	16719,80	SCI
20	ROSCI0063	Defileul Jiului	11156,20	SCI
21	ROSCI0069	Domogled – Valea Cernei	62014,30	SCI
22	ROSCI0085	Frumoasa	137113,00	SCI
23	ROSCI0122	Munții Făgăraș	198512,00	SCI
24	ROSCI0128	Nordul Gorjului de Est	49114,40	SCI
25	ROSCI0129	Nordul Gorjului de Vest	87321,70	SCI

26	ROSCI0132	Oltul Mijlociu – Cibin - Hărtibaciu	2053,80	SCI
27	ROSCI0140	Pădurea Călugăreasca	705,20	SCI
28	ROSCI0166	Padurea Reşca - Hotărani	1651,80	SCI
29	ROSCI0168	Pădurea Sarului	7005,80	SCI
30	ROSCI0173	Pădurea Stârmina	66,60	SCI
31	ROSCI0174	Pădurea Studinița	122,80	SCI
32	ROSCI0177	Pădurea Topana	878,20	SCI
33	ROSCI0183	Pădurea Vlădila	414,00	SCI
34	ROSCI0188	Parâng	29907,10	SCI
35	ROSCI0198	Platoul Mehedinți	53891,80	SCI
36	ROSCI0202	Poiana Bujorului din Pădurea Plenița	44,30	SCI
37	ROSCI0206	Porțile de Fier	125971,50	SCI
38	ROSCI0217	Retezat	43197,90	SCI
39	ROSCI0225	Seaca – Optășani	2145,70	SCI
40	ROSCI0239	Târnovu Mare – Latoriția	1304,50	SCI
41	ROSCI0266	Valea Oltețului	1589,60	SCI
42	ROSCI0011	Branistea Catarilor	295,70	SCI

*total surface of the site

The designation of the Natura 2000 network in the SW Region increased the total surface covered by protected areas from 8%, at it was in 2006, to 23% at it is today. One of the most important aspects of the designation of the Natura 2000 network in Oltenia was that the last remnant forests in the plain area were included and they are now protected in the Natura 2000 sites. The main protected forest habitats in these sites are *Luzulo-Fagetum* beech forests (Natura 2000 code – 9110), *Asperulo – Fagetum* beech forests (9130), Eastern white oak woods (a priority habitat), Euro-Siberian steppic woods with *Quercus* spp. (also, a priority habitat) etc. Some of the last remnant forest were included, for example, in the SCI Coridorul Jiului. Pădurea Sarului, Pădurea Studinița, Pădurea Topana, Pădurea Vlădila hadn't any protection status before the designation of Natura 2000 network, but they are designated now as SCI's for forest habitats.

The designation of the big sites in the north of the region (Nordul Gorjului de Est, Nordul Gorjului de Vest, Frumoasa etc) created a long corridor of protected areas from the Danube river to the Olt valley. This corridor is very important for the cohesion of the habitats and for the movement of the animals.

The facts mentioned above are only to emphasize the role and the importance that the Natura 2000 designation had for the biodiversity conservation in Oltenia Region.

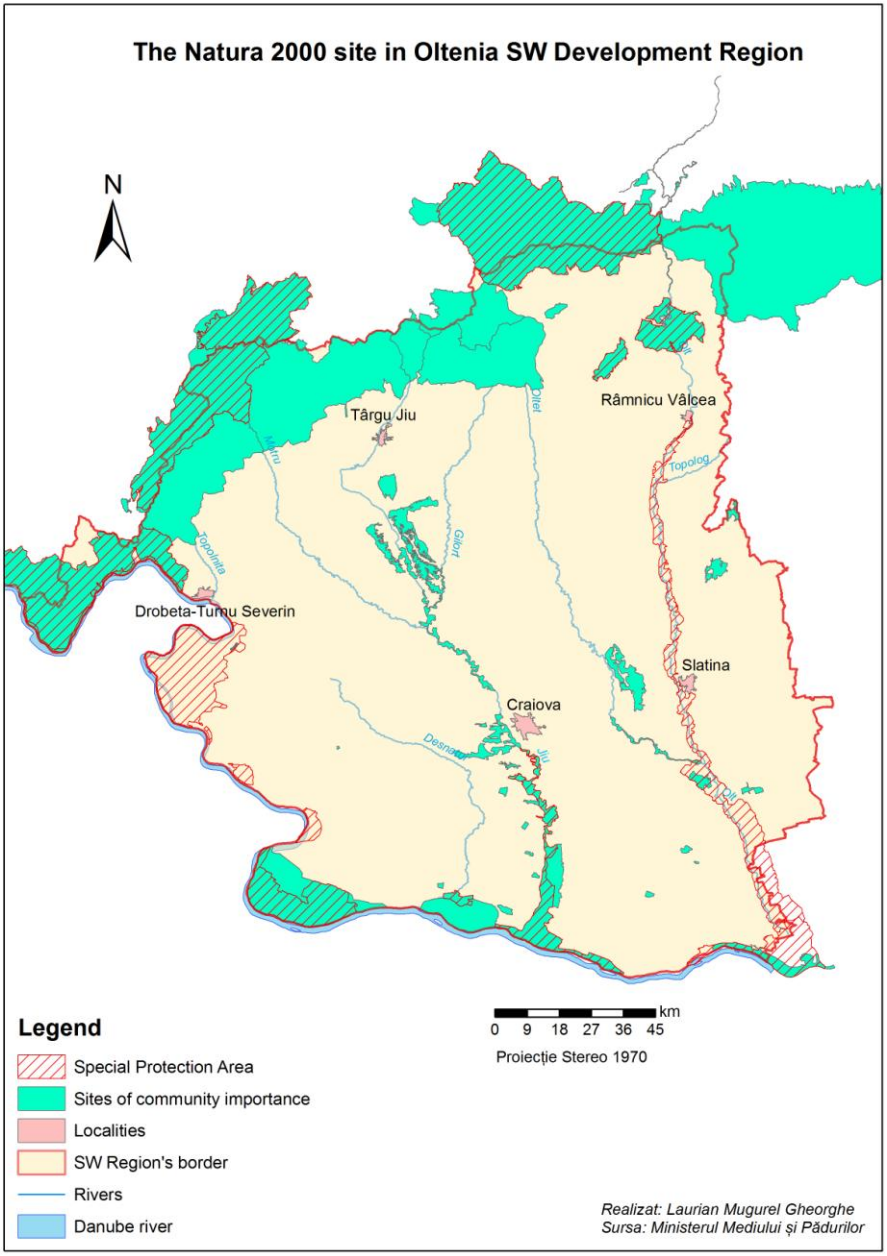

Figure 1 The Natura 2000 sites in the SW Region

Methods

In our analyze of the changes in the land cover use in Oltenia's Natura 2000 sites we used data from Corine Land Cover 1990, Corine Land Cover 2006, Land Parcel Information System, topographical maps and aerial images. We used the Natura 2000 sites vectorial borders provided by the Ministry of Environment and Forests. By using the GIS software, we analyzed the land cover inside the Natura 2000 sites in 1990 and 2006. The purpose was to see how the land cover changed after 1990, a very important milestone in the economy of our country.

Results and discussion

The Natura 2000 network was designated in 2007, but the process started a few years ago, by collecting data, with the participation of the numerous public institutions, universities, research institutes,

In 2006, the forests covered almost 60% of the Natura 2000 sites surface in Oltenia Region. This is an important percentage and, together with the naturality index prove that the area proposed to be part of the Natura 2000 in 2006 had a high degree of naturality. The naturality index measures how much forest covers a particular area. It has the following formula (Dumitrascu, 2006):

$$I_{nat} = \text{Forest area/Total area X } 100$$

Croplands covered 15% of the total surface designated as Natura 2000 in Oltenia Region in 2006, followed by pastures with 13%, wetlands 5.8%, built land 1.6 and non productive land 4.27%. We can see that the most important surface is covered by natural and semi natural habitats, while the anthropic ecosystem represents a small percentage.

The situation wasn't too much different in 1990: the percentage of forests was the same, indicating that, between 1990-2006 the naturality index inside the Natura 2000 didn't change, so the status of these ecosystems remained close to the natural one, without too much anthropic pression. Of course, this is not surprising, because the areas were proposed to be included in the Natura 2000 network in 2006.

Regarding the other categories of land cover, the percentage of pastures was 15.76%, croplands 14.05%, wetlands 5,98%, built land 1.58%, and non productive land 2.87%.

The differences of the land cover between 1990 and 2006 inside the Natura 2000 sites in the SW Region are presented in the figure 2.

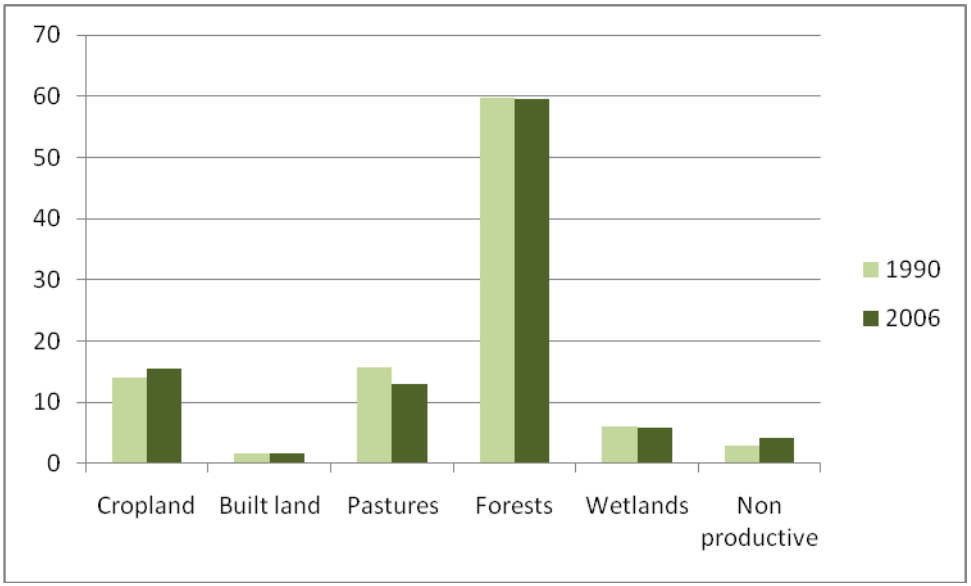

Figure 2 Land cover use inside the Natura 2000 sites in Oltenia Region in 1990 and 2006 (percentage of the total Natura 2000 surface)

The land cover use inside the Natura 2000 sites between 1990 and 2006 didn't change to much. Some slightly differences exist in this period for cropland, pastures and non productive land. The surface used for cropland grew with almost 2%, while the pastures diminished with 2.8%. We think this is an effect of the restitution of the land which caused big transformations in the land use at the national level. There is also, a very small growth of the built land, because of the extension of the localities inside the Natura 2000 sites.

Conclusions

The land cover use inside the Natura 2000 sites in Oltenia Region remained almost the same between 1990 and 2006, proving that the human pressures on the ecosystems included in the Natura 2000 network was pretty low. We don't know what is the situation with the land use outside the Natura 2000, in the close vicinity. This should be the purpose of another study who should also take into account the spatial impact of the designation of the Natura 2000 sites, that means the impact that conservation measures will have on the use of the land.

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