Chapter 77
Agriculture and Conservation in the Natura 2000 Network: A Sustainable Development Approach of the European Union

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ABSTRACT

The Natura 2000 network represents a new approach in the sustainable spatial planning promoted at the European Union level. Agricultural landscapes comprise 28.6% of the surface area of the Natura 2000 sites, many of which have significant conservation values. Plant and animal species, and approximately 30% of the natural habitats of community interest are directly influenced by the presence of certain agricultural activities. This chapter presents a GIS analysis of the European Union Natura 2000 ecological network: spatial distribution of Natura 2000 sites in EU-27, dynamic agricultural surfaces in Natura 2000 sites, and GIS tools in managing process. GIS techniques must represent the tool by which the efficiency of this ecological network is monitored, as it must be permanently nourished with important financial resources.

INTRODUCTION

Ecologically, agriculture has a dual nature, being considered the main risk affecting biodiversity at a global level (Primack, Patroescu, Rozylowicz & Ioja, 2008) but also the support for sustaining biological communities (Baur et al., 2006; Kuemmerle, Muller, Griffiths & Rusu, 2009; Pykala, 2003; Ruprecht, Enyedi, Eckstein & Donath, 2010). Globally, protected areas embody the most frequently used instrument for limiting threats upon representative samples of species and natural ecosystems (Balmford et al., 2002),

DOI: 10.4018/978-1-4666-2038-4.ch077

but also for preserving and valorising certain traditional agricultural landscapes (Plieninger, Hochtl & Spek, 2006).

The intensity of biodiversity threats induced by agriculture is extremely high in EU-27, where agricultural fields comprise 47.4% of the land area (European Commission, 2009). Habitat disturbance, overexploitation, pollution, invasive alien species, and disease characterize the most common threats encountered in the European space in which agricultural activities affect biodiversity (Plieninger et al., 2006; Primack et al., 2008; Schmitt & Rakosy, 2007).

Agricultural techniques are becoming increasingly destructive, as the methods are devoted mainly to an increase in productivity (Stoate et al., 2009). This destruction can be minimized by the new orientations of the Common Agricultural Policy (CAP), promoting agri-environmental schemes (EEA, 2005; Piorr et al., 2009). The CAP will moderate the negative effects of agriculture upon biodiversity (Henle et al., 2008), and reactivate benefits generated by ecosystem services (Hockings, 2003). The new schemes may also be crucial in maintaining the efficiency of agricultural activities (EEA, 2009; Piorr et al., 2009). Illustrative of this issue is the promotion of incentives for high nature value farmland, with the purpose of increasing the conservation of avian species dependant on agricultural habitats (EEA, 2004).

In this framework, the Natura 2000 network represents an European Union goal, aimed at promoting the conservation of natural habitats of flora and fauna species, without excluding populated communities and local economy (Mucher, Hennekens, Bunce, Schaminee & Schaepman, 2009; Pullin et al., 2009; Silva, 2009). The enforcement of the Natura 2000 network appeared as a necessity in fulfilling the objectives of reducing species and habitats loss (Pullin et al., 2009). The European Union, through the Convention on Biodiversity, Habitats and Birds Directives, assumed these objectives (Cogalniceanu & Cogalniceanu, 2010).

The projected benefits of the Natura 2000 network regarding risk control can confer long-term protection to a greater number of species and habitats, and a more efficient use of the available natural resources (European Commission, 2009; Ioja et al., 2010). Beside their inherent ecological value (Gaston, Jackson, Nagy, Cantu-Salazar & Johnson, 2008) in underdeveloped areas many Natura 2000 sites are created for the potential to alleviate social and/or economic issues (Dimitrakopoulos, Memtsas & Troumbis, 2004; Mauerhofer, 2010; Rauschmayer, van den Hove & Koetz, 2009).

The Natura 2000 network is perceived as a "social network" fit for the European Union landscape that intertwines the preservation of nature with the maintenance of a sustainable traditional lifestyle for the local communities (e.g., supply of locally grown products/produce, local employment opportunities, and/or eco-tourism) (Bladt, Strange, Abildtrup, Svenning & Skov, 2009; Maiorano, Falcucci, Garton & Boitani, 2007; Young et al., 2007).

Integrating the socio-economic elements among the management objectives of the Natura 2000 sites significantly complicates the management methods (Pullin et al., 2009), the interest in utilizing natural resources, and rendering services being often of higher importance value than conservation (Anthon, Garcia & Stenger, 2010; Berentsen, Hendriksen, Heijman & van Vlokhoven, 2007).

To achieve the proposed conservation and social goals, the Natura 2000 network requires a considerable capital infusion of 5.58 billion €/year for administration in EU developed countries only (Bladt et al., 2009). For comparison, approximately the same amount is invested yearly in conservation worldwide, with developing countries accounting for less than 12% of the total (Bruner, Gullison & Balmford, 2004; James, Gaston & Balmford, 2001).

The management process for the Natura 2000 sites is one aimed at transparency in decision mak-