

Chapter 77

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

Cristian Ioja

University of Bucharest, Romania

Maria Patroescu

University of Bucharest, Romania

Laurențiu Rozyłowicz

University of Bucharest, Romania

Mihai Niță

University of Bucharest, Romania

Diana Onose

University of Bucharest, Romania

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, Rozyłowicz & Ioja, 2008) but also the support for sustain-

ing 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; Piore 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; Piore 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, Henkens, 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-

19 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/agriculture-conservation-natura-2000-network/70505

Related Content

Developing a Method for Visualizing Population Movements

Matthew Kwan, Colin Arrowsmith and William Cartwright (2015). *Geo-Intelligence and Visualization through Big Data Trends* (pp. 205-221).

www.irma-international.org/chapter/developing-a-method-for-visualizing-population-movements/136105

Emerging Retail Strategies in Urban Canada

Tony Hernandez and Magnus Svindal (2012). *Geospatial Technologies and Advancing Geographic Decision Making: Issues and Trends* (pp. 114-131).

www.irma-international.org/chapter/emerging-retail-strategies-urban-canada/63600

What the Future Holds: Trends in GIS and Academic Libraries

John Abresch, Ardis Hanson, Susan Jane Heron and Peter J. Rheeling (2008). *Integrating Geographic Information Systems into Library Services: A Guide for Academic Libraries* (pp. 267-295).

www.irma-international.org/chapter/future-holds-trends-gis-academic/24027

Geographic Information System Effects on Policing Efficacy: An Evaluation of Empirical Assessments

Yan Zhang, Larry Hoover and Jihong (Solomon) Zhao (2014). *International Journal of Applied Geospatial Research* (pp. 30-43).

www.irma-international.org/article/geographic-information-system-effects-on-policing-efficacy/111099

Irrigation Monitoring Using Geospatial Techniques in Plastic Greenhouse Landscapes: Case Study – Chtouka Plain, Morocco

Mustapha Mimouni, Nabil Ben Khatra, Amjed Hadj Tayeb and Sami Faiz (2021). *Interdisciplinary Approaches to Spatial Optimization Issues* (pp. 105-122).

www.irma-international.org/chapter/irrigation-monitoring-using-geospatial-techniques-in-plastic-greenhouse-landscapes/279253