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Securing the Conservation of biodiversity across Administrative Levels and spatial, temporal, and Ecological Scales

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SCALES seeks ways to better integrate the issue of scale into policy and decision-making and biodiversity management in the EU.
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SCALES briefs 7

Improving the effectiveness of agri-environment schemes for biodiversity conservation

Summary

The conservation of agricultural environments in Europe is largely accomplished via voluntary management contracts in agri-environment schemes. The effectiveness of agri-environment schemes has often been found to be unsatisfactory, especially considering the amount of funding allocated. Recent research suggests that the use of computational planning tools, and spatial prioritization in particular, could help in distributing funding and resources to sites with superior spatial connectivity and higher local habitat quality. In this study an authority-driven approach, the Natura 2000 network, was found to succeed better at including high value sites versus voluntary-based conservation. The main challenge lies in developing the voluntary based mechanism so that the chances of inclusion of the most valuable areas are increased without compromising the legitimacy of conservation in the eyes of the land owners.

Figure 1. Flower-rich semi-natural grasslands are the home of many butterflies. Photo: Chris van Swaay. http://www.eea.europa.eu/highlights/populations-of-grassland-butterflies-decline/european-grassland-butterfly-indicator-pictures

Figure 2. Agricultural intensification leads to monotonous landscapes with reduced biodiversity. Intensively farmed grassland, Wageningen, Netherlands. Photo: Chris van Swaay. http://www.eea.europa.eu/highlights/populations-of-grassland-butterflies-decline/european-grassland-butterfly-indicator-pictures

Key words

Agri-environment schemes, semi-natural grasslands, spatial conservation planning, conservation prioritization, voluntary conservation, Zonation

Relevance to legislation

- EU's Common Agricultural policy (CAP) and national agri-environment schemes

Relevance to actual environmental problems

farmland biodiversity decline; land-use change; fragmentation of habitat; agricultural intensification.

Description of the problem

Agricultural intensification and marginalization are two major drivers of biodiversity decline throughout Europe (Kleijn et al. 2011). Together they have led to a dramatic decline of semi-natural grasslands, resulting in a severe habitat loss and fragmentation. Various studies on semi-natural grasslands around Europe have reported percentages of habitat loss as high as 95% to 99% (Polus et al. 2006, Hooftman and Bullock 2012, Figures 2, 4).

Agri-environment schemes governed by EU regulation are a potentially significant tool in combating this decline. The traditional semi-natural habitats are dependent on continuous management that protects them from overgrowth. Thus, specific schemes that aim at maintenance of traditional agricultural environments through active habitat management and restoration have an important role in farmland biodiversity protection (Krauss et al. 2010). However, despite high levels of spending, experiences of the effectiveness of AES measures have been mixed.

Recent research has shown how computational conservation planning tools could help with improving the effectiveness of the agri-environment schemes (Arponen et al. 2013). A planning tool called Zonation (Moilanen et al. 2012) was used to identify well-connected networks of high quality grassland sites (Figure 3). These sites partially coincided with the areas that were under agri-environment scheme management contracts, but ca. 25-30% of the sites with highest conservation value were unmanaged. Arponen and colleagues (2013) found that to achieve the similar conservation benefits as with an optimal network of sites, one would have to expand the current network of managed sites by 50%. This implies that reallocation of management contracts would be a more cost-effective strategy.

The authors also showed how an authority-driven conservation approach – the Natura 2000 network – had captured valuable sites better than the voluntary agri-environment schemes. Even though voluntary measures have their advantages from a socio-political perspective (Paloniemi & Varho, 2009), the study shows that more attention should be paid to improve ecological effectiveness.

The study is based on research carried out within the EU FP7 project SCALES, published in the journal Biological Conservation.

Recommendations

The authors point out that in order to improve the effectiveness of voluntary agri-environment schemes, decision makers should use landscape level criteria for granting subsidies. Spatial conservation prioritization tools, like Zonation, are able to provide necessary information on the best locations for conservation management and ecological coherence of managed sites. The relatively high ecological effectiveness of non-voluntary conservation schemes, like Natura 2000, suggests that these kinds of measures should have a role in a larger conservation strategy in the future. The success of the agri-environment schemes depends on the ability to motivate and involve the right people to take management action on the right sites. Potential means to achieve this include:

- Increased financial compensation. Currently only expenses are covered, which offers no true incentive for farmers to participate.
- Differentiating payments according to the conservation value of the site. This could encourage the owners with most valuable sites to enroll.
- Agglomeration bonuses to enhance spatial connectivity. This could encourage the farmers to regional collaborations, ensuring the management of large enough habitat networks.
- Improved dialog between authorities and the land owners, to enhance landowners' awareness of the possibilities to use agri-environment schemes in safeguarding biodiversity, as well as to share various knowledge about the conservation value and management demands of habitats and species that the schemes target.

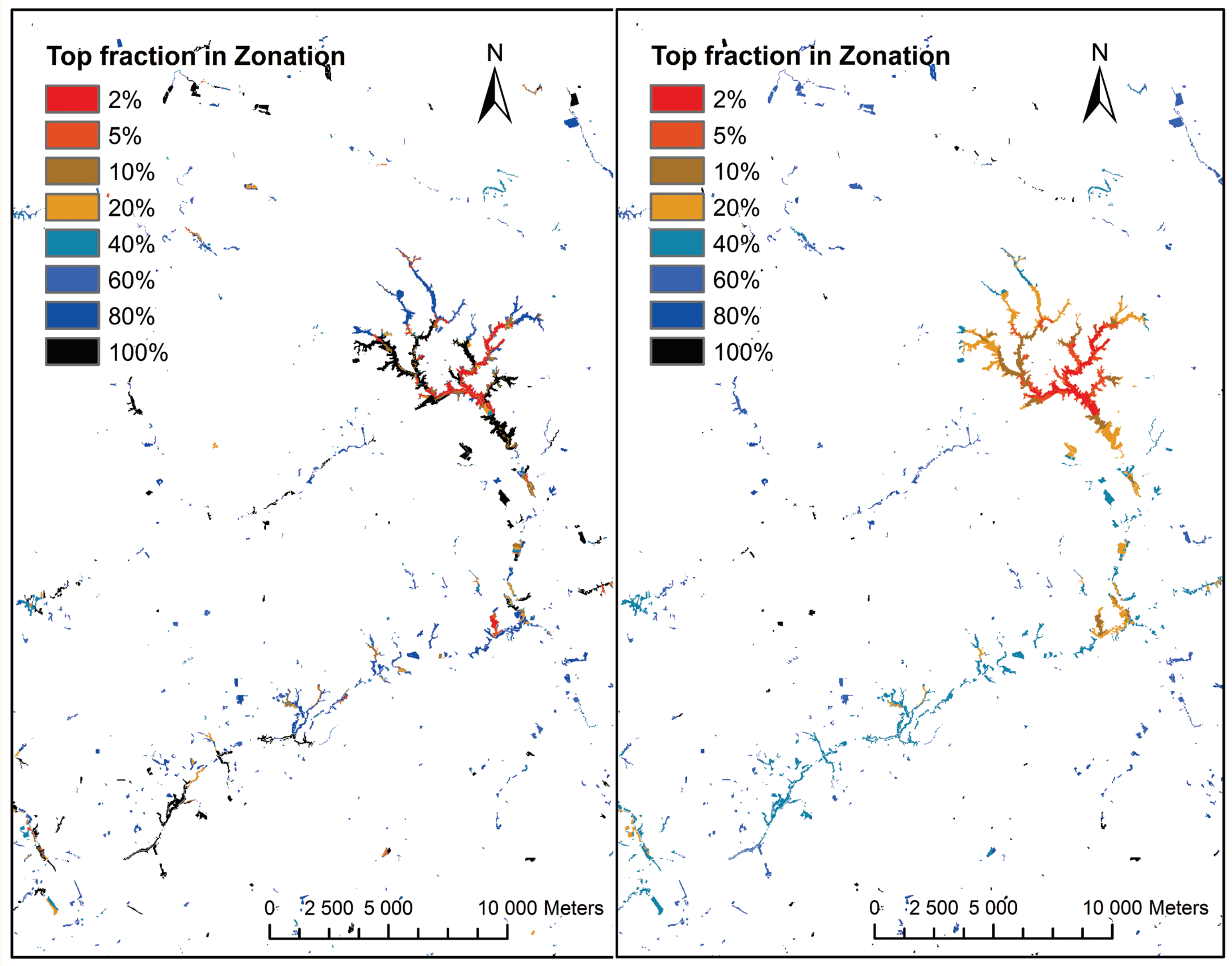

Figure 3. Priority rank maps from Zonation prioritization. The colors indicate high (red tones) and low (black) conservation priority: e.g. the best 2% of the landscape are in bright red. The maps show only a small subsection of the study region because the grassland sites are very small and scattered. On the left is what would be prioritized when not using connectivity, and on the right is the solution with 2km connectivity.

The study identifies a major challenge as the lack of flexibility in current policy instruments to reflect differences in conservation value. More attention should be paid to the incentive structure and dialog between farmers and those responsible for conservation planning on a regional scale. The authors conclude that in order to adhere to the commitments of halting farmland biodiversity loss, the policy instruments for biodiversity conservation should be redesigned, which requires action both at EU and national level. Without EU level policy changes, the space of freedom of Member States is significantly constrained by EU regulation

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Sources

Arponen, A, Heikkinen, RK, Paloniemi, R, Pöyry, J, Similä, J, Kuussaari, M (2013) Improving conservation planning for semi-natural grasslands: Integrating connectivity into agri-environment schemes. Biological conservation, 160: 234-241. doi: 10.1016/j.biocon.2013.01.018

Hooftman, DAP, Bullock, JM (2012) Mapping to inform conservation: a case study of changes in semi-natural habitats and their connectivity over 70 years. Biological conservation, 145: 30-38. doi: 10.1016/j.biocon.2011.09.015

Kleijn, D, Rundlöf, M, Scheper, J, Smith, HG, Tscharntke, T (2011) Does conservation on farmland contribute to halting the biodiversity decline? Trends in Ecology & Evolution, 26: 474-481. doi: 10.1016/j.tree.2011.05.009.

Krauss, J, Bommarco, R, Guardiola, M, Heikkinen, RK, Helm, A, Kuussaari, M, Lindborg, R, Ockinger, E, Pärtel, M, Pino, J, Pöyry, J, Raatikainen, KM, Sang, A, Stefanescu, C, Teder, T, Zobel, M, Steffan-Dewenter, I (2010) Habitat fragmentation causes immediate and time-delayed biodiversity loss at different trophic levels. Ecology letters, 13: 597-605. doi: 10.1111/j.1461-0248.2010.01457.x

Moilanen, A, Leppänen, J, Meller, L, Montesino Pouzols, F, Arponen, A, Kujala, H (2012) Spatial conservation planning framework and software Zonation v. 3.1: User manual. http://cbig.it.helsinki.fi/software/zonation/

Paloniemi, R, Varho, V (2009) Changing ecological and cultural states and preferences of nature conservation policy: the case of nature values trade in South-Western Finland. Journal of Rural Studies, 25: 87-97. doi: 10.1016/j.jrurstud.2008.06.004

Polus, E, Vandewoestijne, S, Choutt, J, Baguette, M (2006) Tracking the effects of one century of habitat loss and fragmentation on calcareous grassland butterfly communities. Biodiversity & Conservation, 16: 3423-3436. doi: 10.1007/s10531-006-9008-y

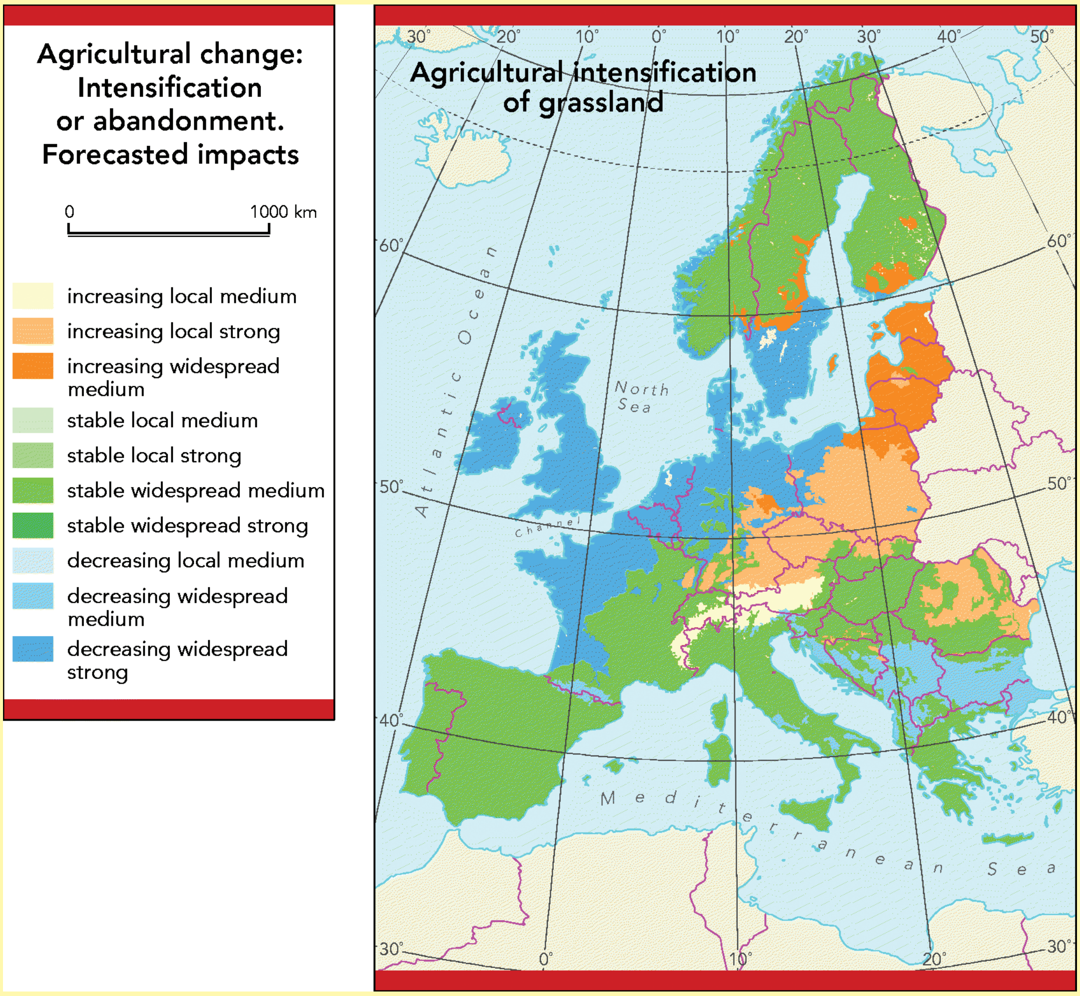

Figure 4. Forecasts of agricultural intensification in Europe. Source: EEA http://www.eea.europa.eu/data-and-maps/figures/ds_resolveuid/9056002F-A642-4765-8DCF-EA575C9FE5CB