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OPINION

Can research in Western Europe identify the fate of farmland bird biodiversity in Eastern Europe?

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Abstract. Birds are commonly used as an example of the strongly declining farmland biodiversity in Europe. The populations of many species have been shown to suffer from intensification of management, reduction of landscape heterogeneity, and habitat loss and fragmentation. These conditions particularly dominate farmland in the economically well developed countries of Western Europe. Currently, the farmland environment in Central-Eastern Europe is generally more extensive than in Western Europe and a larger proportion of people still live in rural areas; thus generating different conditions for birds living in agricultural areas. Furthermore, the quasi-subsistence farming in much of Central-Eastern Europe has resulted in agricultural landscapes that are generally more complex than those in Western Europe. To protect declining bird populations living in farmland, detailed knowledge on both species and communities is necessary. However, due to scientific tradition and availability of funding, the majority of studies have been carried out in Western Europe. In consequence this provokes a question: are findings obtained in western conditions useful to identify the fate of farmland bird biodiversity in Central-Eastern Europe? Therefore, the major goal of this paper is to highlight some local and regional differences in biodiversity patterns within EU farmland by comparing intensive agricultural landscapes with more extensive ones. More specifically, we aim to outline differences in agricultural landscapes and land use history in the two regions, use farmland birds to provide examples of the differences in species dynamics and species-habitat interactions between the two regions, and discuss possible social and ecological drivers of the differences in the context of biodiversity conservation. Factors governing spatio-temporal dynamics of farmland bird populations may differ in intensive and extensive landscapes as illustrated here using the Grey Partridge *Perdix perdix* and the Red-backed Shrike *Lanius collurio* as examples. The unevenness of farmland bird studies distribution across Europe was also presented.We call for more emphasis on pluralism in furthering both pan-European research on farmland bird ecology and conservation strategies. We also highlight some features specific to Central-Eastern Europe that merit consideration for the more efficient conservation of farmland birds and farmland biodiversity across Europe.

Key words: landscape ecology, habitat, matrix, Central and Eastern Europe, Grey Partridge, *Perdix perdix*, Red-backed Shrike, *Lanius collurio*

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FARMLAND BIODIVERSITY AND ITS CONSERVATION WITHIN THE EUROPEAN UNION

Farmland biodiversity is currently under threat in much of Europe. Declines in both species numbers and in population sizes have been recorded in all major taxa including plants (e.g. Andreasen et al. 1996), insects (e.g. Kuussaari et al. 2007, Van Dyck et al. 2009), birds (e.g. Wretenberg et al. 2007), and mammals (de Heer et al. 2005). Some of the major drivers of biodiversity loss in farmland are linked to management intensification (e.g. Tscharntke et al. 2005, Báldi & Faragó 2007) and landuse change (e.g. Orłowski 2004, 2005, 2010, Kuemmerle et al. 2008, Spitzer et al. 2009). The major policy tools available for halting biodiversity loss in farmland are agri-environment schemes and the declaration of protected areas. Although both approaches may be powerful tools for biological conservation in farmland, recent findings showed mixed benefits of agri-environment schemes for biodiversity. Specifically, they have been demonstrated to be less effective in landscapes highly affected by intensive management (Kleijn et al. 2006, Konvička et al. 2008, Ohl et al. 2008) then in less impacted landscapes (Kovács-Hostyánszki et al. 2011) and have limited efficiency in promoting small-scale, quasi-subsistence, and often traditional farming. However, the meta-analysis by Batáry et al. (2011) suggested that agri-environment schemes could benefit biodiversity, for example, in simple arable landscapes. The establishment of protected areas (such as the Natura 2000 sites in the EU) may, in turn, result in conflicts with local communities and are therefore suboptimal for management for biodiversity (Kluvánková-Oravská et al. 2009). Moreover, in some Eastern European countries a considerable farmland biodiversity is found outside Natura 2000 areas. For example, the traditional model of field division by perennial field margins, retained in many regions of Poland, significantly improves the biodiversity, irrespective of the protection system (Wuczyński et al. 2011). Recently this value has been threatened, for example by urbanisation, infrastructure development, and the adoption of the Common Agricultural Policy.

Biological conservation in Europe's farmland remains, therefore, a challenge for both conservation biologists and policy makers. To develop truly efficient and large-scale (e.g. the EU or all of Europe) conservation strategies, both researchers and policy makers need to understand regional differences in social and ecological systems and how these are linked to biodiversity.

The major goal of this paper is to highlight some local and regional differences in biodiversity patterns within EU farmland by comparing intensive agricultural landscapes with more extensive ones. More specifically, we aim to (i) outline differences in agricultural landscapes and landuse history in the two regions, (ii) use farmland birds to provide examples of the differences in species dynamics and species-habitat interactions between the two regions, and (iii) discuss possible social and ecological drivers of the differences in the context of biodiversity conservation. In the following, we "divide" Europe into two main regions that differ with respect to the agricultural impact on habitats and landscapes: the EU15 located mainly in Western Europe (Austria, Belgium, Danmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden, the UK, The Netherlands) and the new member states that joined the EU in 2004 and 2007 and which are located mainly in Central and Eastern Europe (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia,). Hereafter, we refer to the two regions as "Western Europe" (WE) and "Central-Eastern Europe" (CEE).

Bird communities are regarded as an important group for assessing the extent of land use change on overall biodiversity because they are: (i) flagship species, that are popular with the public and visible on a political arena, (ii) they are relatively easy to survey, and finally (iii) they are sensitive to environmental change, including agricultural intensification (Gregory et al. 2005, 2007, Reif et al. 2008a,b, Sanderson et al. 2009).

AGRICULTURAL LANDSCAPES AND FARMLAND BIRD POPULATIONS IN WESTERN AND CENTRAL-EASTERN EUROPE

Agricultural production

Agriculture differs between WE and CEE in terms of its role in society and level of intensification (Table 1). In general, in CEE national agricultural production plays a much more important role in economy and society compared to WE. The proportion of the human population employed in agriculture is several times larger in CEE compared to WE (Table 2). At the same time, CEE countries differ in the outcomes of past agricultural intensification: in some states, such as the Czech Republic and much of Slovakia, the communist "collectivist" agriculture created large monoculture fields, not unlike those in North-Western Europe (Reif et al. 2008). In many CEE countries though, small family farms have retained smaller field sizes and farming methods remain as they were decades ago. In Poland, nearly half of the > 2.5 million farms are still smaller than 2 ha, and this field mosaic is enriched by a dense network of seminatural field margins (Wuczyński et al. 2011). In some others, such as Hungary or Romania, mixed systems with intensive agriculture exist side-by-side with traditional farming in remote areas. Generally, small farms (< 5 ha) are much more abundant in CEE than in WE, for example, there are over 50 times more such farms in Romania than in the UK and nearly 20 times more in Poland than in Germany (Table 2). Productivity also shows great differ-ences between EU regions. For example, milk yield per cow shows nearly a 3-fold difference and potato yields over a 4-fold difference between CEE and WE countries (Central Statistical Office 2009).

Changed demographic conditions and profitability of agriculture in the CEE countries increased land abandonment. But the rural socio-ecological systems in CEE countries may still represent important reference points for WE conservation targets (de Heer et al. 2005). For example, many traditional rural communities in CEE still use agricultural techniques little changed in centuries. In such conditions, populations of many endangered birds may be stable and widespread. Such systems require mostly maintenance rather than restoration activities, the latter being

Table 1. Broad comparison of some characteristic features of extensively (Central and Eastern European — CEE) and intensively managed farmland (Western European — WE). Compiled from various available published data.

	CEE farmland	WE farmland
ECOLOGICAL CHARACTER		
Landscape element		
Extent of semi-natural vegetation cover	Well represented, continuous and maintained by traditional, low impact agriculture	Poorly represented, in isolated patches, mostly where land use is extensive
Extent of transitional elements between and within patches	Well represented by a diversity of gradients between major landcover types (e.g. forest-grassland ecotone, scattered trees across open habitats etc.)	Mostly absent. Sharp transition
Regeneration potential	High potential to regenerate rare species even after decades of apparent "extinction"	Mostly poor
Spatial dynamic of landscapes, habitats and populations	High, characterized by fluidity	Mostly low, landscape elements being
SOCIO-ECONOMIC CHARACTER		
Rural communities, holdings and "expert knowledge" of farmers	Well represented. Variable holding size across CEE countries, but small farms predominate. Small family subsistence farming is common in CEE. Most farmers are not "experts" (e.g. not accredited by academic institutions)	Low percrent of people live on farms.. Holding size is commonly large. Considerable number of owners or managers are "expert" farmers and farming is run as a business
Traditional knowledge and expertise	Well represented, supports continuation of practices that had a crucial importance in shaping and maintaining species-rich farmland during recent centuries	Poorly represented. People not connected anymore to landscapes in a traditional cultural way and innovations of the recent decades had modified the practices. Modern knowledge and technology is widely utilised in decision-making
Chemical use	Low	High
Scientific knowledge regarding biodiversity (no. of papers in Web of Science and Scopus)	Mostly low	High
BIODIVERSITY STATE		
Gamma biodiversity	Mostly high	Mostly low
Farmland biodiversity, including birds	High	Low
Within plot vegetation heterogeneity	High	Low
Within plot vegetation density	Low	High

more typical of the "Western" type of conservation approach (de Heer et al. 2005, Nagy et al. 2009).

However, many CEE countries attempt to copy the WE style of intensive farming regardless of its environmental consequences. The existence of agri-environment schemes (AES) has a relatively minor influence on agricultural development (Nagy et al. 2009). The administrative bureaucracy for payments is too complex for small family farms, thus benefits accrue to large farming companies that tend to be much more intensive.

Patterns in bird population sizes

Bird species composition and abundance in agricultural landscapes show a distinct pattern along the East-West gradient. Several species inhabiting extensive farmland in Europe, including Species of European Conservation Concern (SPEC), are still much more common in CEE than WE (e.g. Moga et al. 2010). This is also true for the majority of birds included in the Farmland Bird Index (FBI) (Gregory et al. 2005). For instance, BirdLife International (2004) estimates abundance of the Corncrake on 551–559 singing males in France and 2000–3100 in Germany. In comparison, the number of singing males estimated for Poland is 30,000–45,000 and for Romania 44,000– 60,000, both countries being smaller than France and Germany. Furthermore, the abundance of White Stork *Ciconia ciconia* is estimated as 646–655 pairs in France and 44,000–46,000 pairs in Poland (although only 4,000–5,000 pairs in Romania) and the Corn Bunting *Emberiza calandra* is estimated as 8,500–12,200 pairs in the UK and 165,000–22,5000 pairs in the similarly-sized Hungary.

However, in some CEE countries, little is known how the ultimate factors linked to habitat intensification drive population declines in different bird species (Stoate et al. 2009).

DIFFERENCES IN BIRD POPULATION DYNAMICS

Similarly, long-term trends in the populations of several farmland bird species differ greatly between WE and CEE (Voříšek et al. 2007, European Bird Census Council, www.ebcc.info). The different levels of habitat and landscape structure caused by agricultural management may mean that both spatial and population ecology models fitted to data collected in WE may be of restricted value in CEE. Further increases in agricultural intensification may affect birds in different, and even contrasting, ways in intensively versus extensively managed landscapes. Moreover, all else (e.g. landscape structure, landuse type) being equal, the temporal exposure to intensive land management may also create different patterns of biodiversity.

Table 2. Selected characteristics of agriculture in some European countries in 2007 presented for CEE and WE groups in alphabetical order (Central Statistical Office 2009).

	Country (area in thousands km^2)	Agricultural population as % of total population	Number of farms < 5ha (in thousands)	Yields of cereals per 1 ha (in dt)	Yields of potatoes per 1 ha (in dt)	Milk yield per cow (in kg)
Central-Eastern Europe	Czech Republic (79)	6.8	19	45.2	257	6716
	Hungary (93)	9.4	500	47.8	222	6874
	Lithuania (65)	11.0	139	30.1	109	4840
	Poland (313)	15.9	1626	32.5	207	4420
	Romania (238)	9.8	3451	16.4	136	3387
	Slovakia (49)	7.7	58	35.6	162	5811
	Average	10.1	965	34.6	182	5341
Western Europe	Austria (84)	3.8	55	58.5	295	5997
	Belgium (31)	1.4	11	78.9	470	6000
	France (547)	2.4	125	65.5	454	6338
	Germany (357)	1.8	82	61.8	423	7048
	Sweden (450)	2.8	10	51.5	277	8657
	United Kingdom (245)	1.6	68	66.3	402	7177
	Average	2.3	59	141.1	387	6870

Differences in the structure and use of agricultural landscapes between WE and CEE are mirrored in changes in bird population abundance. Here we highlight such contrasts using Grey Partridge *Perdix perdix* populations from the UK and Poland as an example.

Example 1: Grey Partridge survival. In the UK, agricultural intensification, in particular the intensive use of pesticides, was the primary reason for the decline of this species in the post-war period. The result was an associated decrease in chick survival rate to 20%, and increases in nest predation and the physical destruction of nesting habitats in field margins also contributed (Potts 1980, 1986, Potts & Aebischer 1995). Some declines in chick survival rate were found in Western Poland between the 1960s and 1980s (Panek 1991). However, during 1991–2003 the mean chick survival rate in Poland was still 43% (Panek 2005). A decrease in chick survival rate was recently noted in Poland, but was much smaller than that in the UK. Further studies suggested that an increase of adult (female) and brood losses, caused by increased Red Fox *Vulpes vulpes* predation, were the primary reasons for a considerable population decline of Grey Partridge in Poland. Changes in nest site availability are believed to be an unimportant factor (Panek 2002, 2005).

The importance of weather conditions in determining short-term population fluctuations in Grey Partridge may be also be different in WE (e.g. the UK: Potts 1986, Potts & Aebischer 1995) and CEE countries (e.g. Poland and Czech Republic: Chlewski & Panek 1988, Panek 1992, Salek et al. 2004). This can be related to the more continental situation of CEE countries. In both countries the mortality of chicks is strongly affected by weather conditions. However, in Poland weather strongly influences winter survival: in extreme winters (e.g. high snow cover, low temperatures) the losses of partridge population can be up to 80–90%, making this species more vulnerable to random weather phenomenon in Central Europe than in the UK (see also Salek et al. 2004).

The above example suggests that the factors underlying population fluctuations may show marked regional differences. Whereas in intensively used farmland (e.g. the UK), population decline can be more related to human activity (land use), in CEE the causes of temporal population fluctuations are currently more complex, and human activity is only one of the drivers and may only indirectly affect the bird populations (e.g., through changing predation levels).

Example 2: Red-backed Shrike site fidelity. Differences between farmland landscape structure in WE and CEE may explain spatial dynamics of farmland bird populations. In the intensive agricultural landscapes of WE, the Red-backed Shrike *Lanius collurio* has a high site fidelity (Jakober & Stauber 1987, Massa & Bottoni 1993, Van Nieuwenhuyse 2000) possibly due to the patchy, isolated character of the breeding habitats which "force" shrikes not to venture into an inhospitable matrix. However, in Polish landscapes the site fidelity of this bird was found to be low and there was a pronounced dynamic in its spatial occurrence. The possible explanation of this finding is the widespread availability of breeding sites (Tryjanowski et al. 2007). In such landscapes, population-related phenomena (e.g., local demographic conditions, food resource use) and other biotic relationships (e.g., predation) may be at least as important as habitat availability in determining spatial patterns of bird occurrence.

THE COMPLEX EFFECTS OF AGRICULTURAL INTENSIFICATION AND LAND ABANDONMENT IN CENTRAL-EASTERN EUROPE

Two contrasting patterns of landuse can be observed in the new EU member states since the collapse of socialism in the 1990s: a further increase in agricultural intensification and land abandonment (Brouwer et al. 1991, Jansen & Hetsen 1991, Deffontaines et al. 1995). These have contrasting effects on farmland birds with the harmful effect of intensification being generally more obvious (Tucker & Evans 1997, Tworek 2010). Land abandonment temporarily increases biodiversity of bird populations as fallow land undergoes natural succession (e.g. toward grassland and/or scrub encroachment) and attracts many species (Bignal 1998, Orłowski 2004, 2006, Grzybek et al. 2008, Nagy et al. 2009). Land abandonment also increases landscape heterogeneity e.g. by increase of transitional elements between grasslands and forests, such as shrubs and young trees, and by creating a novel and usually diverse field type in the open landscape (Herzon et al. 2006). In Slovakia this had a highly positive effect on the endangered Lesser Grey Shrike *Lanius minor* (Krištín et al. 2000). This species benefited from the increased shrub cover and abandoned arable land in a predominantly agricultural matrix that dominated breeding territories. The high arthropod (i.e. food) availability was one key element which attracted the Lesser Grey Shrike to these areas. On the other hand, prey availability was negatively associated with the height and density of plant cover (Schifferli 2001, Romanowski & Żmihorski 2008, Hoste-Danyłow et al. 2010), therefore optimal values of vegetation density will differ according to the taxa and species, and a variation of management regimes may be needed.

The potential positive effects of agricultural land abandonment on biodiversity are obscured by two phenomena: invasion of alien plants and increase of predation. In temperate regions, arable land abandonment results in grassland and eventually, in forests. Once invasive species colonize abandoned land the above mentioned succession process may never occur (Skórka et al. 2007). Some species such as alien Goldenrods *Solidago* spp. or Reed *Phragmites australis* negatively influence arthropod population sizes (Skórka et al. 2007, Moroń et al. 2009) thus potentially reducing food supplies for birds. Indeed, in a study of birds occurring on abandoned grassland in Poland, Skórka et al. (2010) found that invasion of Goldenrods significantly reduced the number of bird species and their abundance (e.g. Corncrake *Crex crex*, Lapwing *Vanellus vanellus*, Yellow Wagtail *Motacilla flava* and Skylark *Alauda arvensis*). A substantial positive effect of the invasion was found for only three species: Whinchat *Saxicola rubetra*, Marsh Warbler *Acrocephalus palustris* and the introduced Pheasant *Phasianus colchicus* (Skórka et al. 2010). More studies on the impact of other invasive species on abandoned semi-natural grassland is urgently needed.

Land abandonment may also attract key predators such as the Red Fox and Magpie *Pica pica* (Skorka et al. unpublished data). These predators were more common in landscapes with a high share (about 20%) of fallow, resulting in lower survival of artificial nests than land-scapes where management practices were pres-ent (Skorka et al. unpublished data, Tryjanowski et al. 2002, Ejsmond 2008; but see Kujawa & Łęcki 2008). The above examples show that the effects of land abandonment on birds are complex and may be both positive and negative, and the net result will depend on the share of abandoned areas at the landscape scale, and on prior land use. Loss of native grassland may be detrimental to biodiversity (Skórka et al. 2010) while abandonment of arable fields may be beneficial to a range of birds associated with meadows (e.g. Whinchat, Corncrake) and shrubs (e.g. Common Whitethroat *Sylvia communis* and Red-backed Shrike), and wet habitats (Reed Bunting *Emberiza schoeniclus*, Marsh Warbler and Common Grasshopper Warbler *Locustella naevia* (Dombrowski & Goławski 2002, Orłowski 2004, 2005, 2010, Berg & Gustafson 2007, Tryjanowski et al. 2009).

No respective phenomenon has been published for WE. It is plausible that most remaining biologically valuable grassland is managed and that invasive species are therefore kept under better control than in CEE.

SPATIAL DISTRIBUTION OF FARMLAND BIRD STUDIES ACROSS EUROPE

The above requires, among others, a greatly increased research effort in the CEE region so that the regional variation in patterns of biodiversity and driving forces behind popu-lation changes can be elucidated and taken into account. Studies dealing with the ecology of farmland birds are unevenly distributed across Europe. A good example is an examination of the publications database "Web of Science" which shows that CEE countries are poorly repre-sented (an exception being Poland), compared to WE, in the literature on farmland biodiversity (Fig. 1). Despite relatively large number of papers addressing links between farmland and birds in Europe the scientific effort is highly diversified among particular countries (Fig. 1). The difference between old and new EU members is apparent here. In contrast, the proportion of "farmland papers" among all ornithological papers found in Web of Science for a given country is rather stable and does not show any east-west gradient. Finally, the number of ornithological papers covering farmland is seriously diversified in relation to the number of active farmers in a given country. In WE the number of farmers is lower, whereas the number of papers is much higher than in CEE (Fig. 1).

ARE CENTRAL-EASTERN EUROPE COUNTRIES DESTINED TO FOLLOW THE WESTERN EUROPE PATTERN OF FARMLAND BIODIVERSITY DECLINE?

After the Second World War most of the indices of agricultural production were considerably lower in the CEE countries than in WE (reviewed in Bański 2008; see also Donald et al. 2006). This difference was also present after the fall of socialism and communism, i.e. from the 1990s, when agricultural production started to increase from relatively low levels. For example, in Poland the main indices of agricultural production have risen sharply over the last 20 years, although they still do not match the level observed in the old EU member states (FAOSTAT 2007, Bański 2008; see Table 2). Agricultural intensi-fication caused widespread biodiversity decline in the post-war period in WE countries (Robinson & Sutherland 2002, Benton et al. 2003). The economic and technological isolation of CEE countries during the post-war years might have reduced the rate of decline in farmland biodiversity. However, the situation changed following EU accession. The recent data on bird populations in this region suggests a progressive loss of some species, mainly the open farmland specialists, e.g. Lapwing, Skylark and Grey Partridge (Donald et al. 2006, Goławski 2006, Chylarecki & Jawińska 2007, Voříšek et al. 2007, Orłowski & Ławniczak 2009). A time lag in the agricultural intensification in this part of Europe may therefore mean a repeat of the loss of biodiversity experienced in the older EU countries. This scenario can only be avoided if and when efficient policy tools are in place to counteract the impact of intensification. Funding available for agri-environmental management, requirements to strengthen cross-compliance, and enhanced conservation policy may all contribute to a different trajectory for biodiversity in CEE.

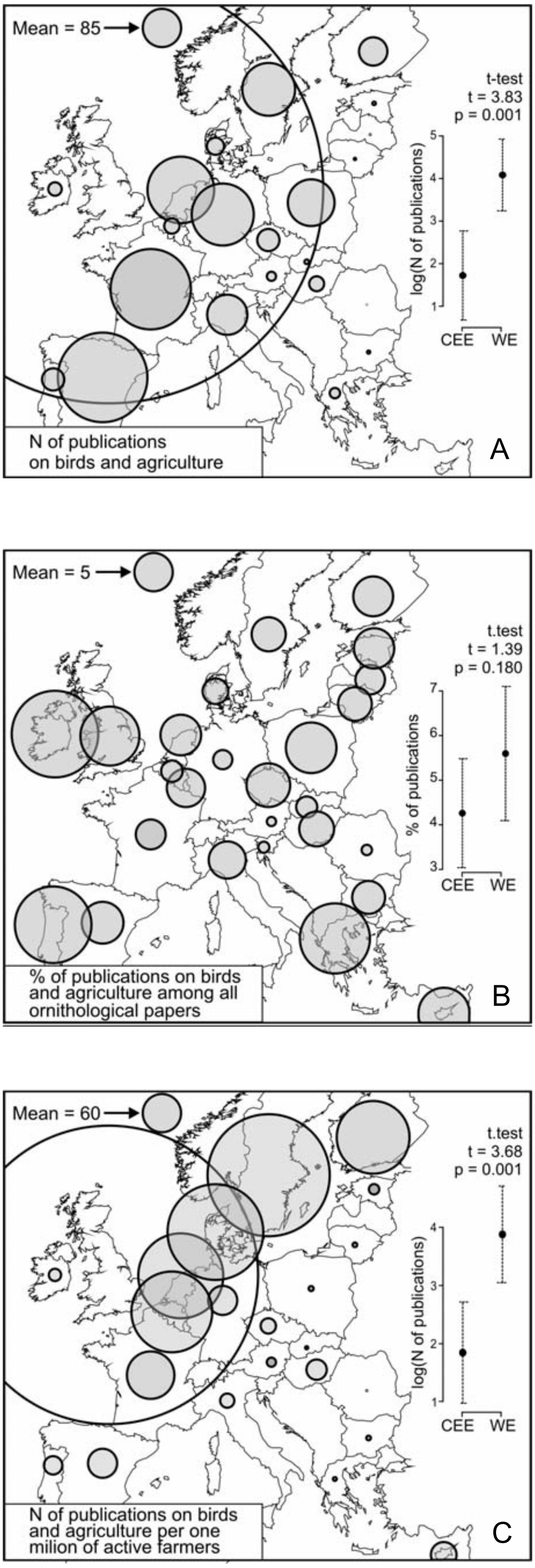

Fig. 1. Variability of scientific literature concerning farmland birds in the European Union (WE — Western Europe, CEE — Central end Eastern Europe). A — total number of publications in the ISI Web of Science database (keywords: "birds" and "agric*" or "farm*") for each country; B — the proportion of publications among all ornithological papers in the database ("birds"); C — the number of publications per one million economically active farmers. Diameter of circles is proportional to the number of publications for each country, the mean value for all countries is taken as 100% and is presented in top-left corner. The circle for the United Kingdom is not shaded to keep the chart legible. Results of t-tests comparing values between WE and CEE countries are presented in each subplot.

CONCLUSIONS

The EU has so far failed to stop biodiversity loss in farmland (Balmford et al. 2005, Pedroli et al. 2007). One reason for this may be in the use of wrongly established reference points by conservation biologists.

The available evidence, modest as it is, suggests that the management solutions developed mainly in WE should not be used as a blanket prescription for the whole of Europe. The concept and approaches of conservation in farmland should be better adjusted to regional patterns and peculiarities. In CEE this includes the high level of biodiversity, widespread occurrence of many species which have fragmented populations in WE, the existence of a "soft matrix" (i.e., extensively managed agricultural landscapes), and the predominance of traditional, farming communities. We stress the need for studies to better understand the ecology of farmland birds in CEE countries and their various links to land use. A great advantage could come, for example, from large pan-European research programmes focusing on population dynamics across the continent but with underlying regional specificity (positive examples are Greenveins, Agripops, and EASY EU projects). This could help in designing appropriate conservation actions applicable across Europe with modifications for individual regions, where necessary. Actions and programs aimed to halt biodiversity loss in EU farmlands should not be separated from other political decisions, such as social policy for the human rural population.

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STRESZCZENIE

[Czy badania wykonywane w Europie Zachodniej pozwalają poprawnie diagnozować stan i zagrożenia bioróżnorodności ptaków krajobrazu rolniczego w Europie Wschodniej?]

Różnorodność biologiczna (RB) krajobrazu rolniczego (KR) jest obecnie zagrożona na większości obszarów Europy. Spowodowane jest to przede wszystkim intensyfikacją gospodarki rolnej i zmianami w użytkowaniu ziemi. Powstały nawet specjalnie dedykowane główne narzędzia służące powstrzymaniu tych niekorzystnych trendów: (a) programy rolno-środowiskowe (PRŚ) i (b) tworzenie obszarów chronionych. Jednak skuteczność PRŚ jest bardzo zróżnicowana, a tworzenie obszarów chronionych powoduje konflikty w lokalnych społecznościach. Zatem skuteczna ochrona RB w KR pozostaje w dalszym ciągu wyzwaniem. Celem artykułu jest zwrócenie uwagi na znaczenie regionalnych różnic w krajobrazie i rolnictwie między Europą Zachodnią (WE), a centralną i wschodnią Europą (CEE) dla stworzenia efektywnej strategii ochrony RB w Europie na przykładzie ptaków.

Rolnictwo w WE i CEE różnią się znacznie (Tab. 1 i 2). Udział ludności zatrudnionej w rolnictwie jest kilka razy większy w CEE i odgrywa ono w tej części Europy znacznie ważniejszą rolę ekonomiczną i społeczną, niż w WE. Jednocześnie produktywność rolnictwa CEE jest znacznie niższa niż WE w wyniku większego udziału ekstensywnej gospodarki rolnej. jednak dzięki temu „swoistemu zacofaniu" KR jest stosunkowo heterogeniczny a populacje wielu zagrożonych w Europie gatunków ptaków są ciągle liczne. Jednak wiele krajów CEE próbuje kopiować rozwiązania typowe dla WE, co prowadzi do intensyfikacji rolnictwa, nie zważając na ich środowiskowe konsekwencje. Jednocześnie, aby złagodzić skutki tych zmian dla RB, w tym ptaków, wprowadza się pewne działania, wypracowane tam, gdzie stało się to konieczne, czyli w WE. Wydaje się jednak, iż różnice w rolnictwie i strukturze krajobrazu mogą powodować, że wypracowane modele populacyjne, jak i próby ochrony ptaków, dopasowane do danych z WE mogą mieć ograniczone zastosowanie w CEE. Wskazane różnice dobrze ilustrują przykłady, dwóch intensywnie badanych w obu częściach Europy gatunków – kuropatwy i gąsiorka. Na podstawie prowadzonych badań, można sądzić, że spadek liczebności kuropatwy w

WE może być przede wszystkim związany ze zmia-nami w gospodarowaniu ziemią (zwiększeniem intensywności rolnictwa), zaś w CEE przyczyny są prawdopodobnie bardziej złożone, np. obejmując także warunki pogodowe (wpływ ostrych zim na przeżywalność). W przypadku gąsiorka mamy do czynienia ze skrajnie różnym do miejsc gniazdowania, co w konsekwencji wpływ na model dyspersji i dynamikę populacji lokalnych. Na terenie WE istnieje silne przywiązanie do wcześniejszych miejsc rozrodu, co może wynikać z bardzo małej liczby i silnej izolacji takich siedlisk, inaczej, niż w CEE, gdzie dostępność do takich miejsc jest zwykle duża, a ich izolacja mniejsza.

Ważnym zjawiskiem jest także to, że w krajach CEE od roku 1990 zachodzą dwa odmienne procesy: wzrost intensywności gospodarowania i rezygnacja z prowadzenia gospodarki rolnej (wielkoskalowe odłogi). Negatywne znaczenie intensyfikacji gospodarki jest jednoznaczne i dobrze znane, natomiast wpływ drugiego procesu jest bardziej złożony. Pola podlegające sukcesji przyciągają wiele gatunków (np. pokląskwę), a ponadto proces ten zwiększa heterogeniczność krajobrazu, co ma pozytywny wpływ na wiele innych gatunków KR (np. na dzierzbę czarnoczelną na Slowacji). Z drugiej strony, gęsta i wysoka pokrywa roślinna może obniżyć dostępność pokarmu dla niektórych gatunków. Ponadto potencjalny pozytywny wpływ rezygnacji z uprawy na RB może być znacznie zmniejszony przez dwa towarzyszące jej zjawiska: inwazję obcych gatunków roślin i wzrost drapieżnictwa. Uogólniając można twierdzić, że utrata ekstensywnie uprawianych łąk w wyniku zaniechania ich wykorzystywania może być szkodliwa dla RB, podczas gdy porzucanie pól może być korzystne dla szeregu gatunków ptaków, wcześniej związanych z łąkami, terenami krzewiastymi i środowiskami wilgotnymi.

Po II Wojnie Światowej wskaźniki efektywności produkcji rolnej w krajach CEE były niższe niż w WE. Ekonomiczna i technologiczna izolacja CEE sprzyjała utrzymaniu dużej RB. Jednakże od czasu zmian politycznych w 1990 w CEE produkcja rolnicza zaczęła wzrastać i chociaż efektywność rolnictwa ciągle pozostaje dużo niższa niż w WE, to ostatnio zgromadzone dane o ptakach z tego regionu pokazują, że po akcesji do UE obserwuje się spadek liczebności wielu gatunków, głównie ptaków otwartego KR. Zatem także CEE może powtórzyć scenariusz utraty znacznej części RB, którego wcześniej doświadczyły kraje WE. Scenariusza tego unikniemy, gdy odpowiednie narzędzia polityczne i ekonomiczne (takie jak PRŚ, zasada wzajemnej zgodności i wzmocniona polityka ochrony przyrody) będą w stanie przeciwdziałać wpływowi intensyfikacji rolnictwa. Dostępne dane sugerują, że rozwiązania opracowane głównie w WE, na terenach z bardzo intensywną gospodarką rolną, nie powinny być traktowane jako gotowa recepta dla całej Europy. Koncepcje ochrony RB w KR powinny być lepiej dostosowane do regionalnej specyfiki. Specyfiką CEE jest wysoki poziom RB, powszechne występowanie wielu gatunków, obecność „miękkiego” *matriksu*, czyli heterogenicznego, ekstensywnie wykorzystywanego krajobrazu rolniczego oraz znaczny udział „tradycyjnych”, rolniczych społeczności. Lepsze zrozumienie regionalnych różnic we wzorcach RB, stojące za tym przyczyny oraz konsekwencje dla strategii ochrony RB wymaga jednak znacznie większych wysiłków badawczych w CEE, gdyż dotychczas ta część Europy w ekologii krajobrazu rolniczego reprezentowana jest słabo. Wielkich korzyści można upatrywać na przykład z wielkich Pan–Europejskich programów, ale działania i programy ukierunkowane na powstrzymanie spadku RB nie powinny być oderwane od innych politycznych decyzji, dotyczących społeczności wiejskich. Jednak by jakiekolwiek działania były skuteczne niezbędne jest poszerzanie wiedzy o poszczególnych gatunkach ptaków, dynamice ich populacji, wybiórczości siedliskowej, jak i reakcji na czynniki stresu środowiskowego (drapieżnictwo, niedobory pokarmu, czynniki meteorologiczne). Sądząc po dynamice badań awifauny KR CEE wiedza ta będzie się stale rozwijała, ale raz jeszcze przestrzegamy przed automatycznym kopiowaniem wzorców wypracowanych w WE i przedstawianiem ich jako panaceum na bolączki związane z negatywnymi zmianami stanu populacji wielu gatunków w CE.

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