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Effects of Habitat Change on Territory Occupancy, Breeding Density and Breeding Success of Long-legged Buzzard (*Buteo rufinus* Cretzschmar, 1927) in Besaparski Ridove Special Protection Area (Natura 2000), Southern Bulgaria

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Abstract: The conversion of pastures into arable lands has led to the decrease in the populations of many bird species throughout Europe. We evaluated the effect of land conversion on the distribution and breeding parameters of the Long-legged Buzzard, a medium-sized SE-European bird of prey, which is potentially vulnerable to these landscape changes. We mapped the distribution of this species in Besaparski Ridove Special Protection Area (southern Bulgaria) in 57 study plots in 2007 and 2011. The productivity in 2011 was 24.56% lower than in 2007. The breeding success was 59.31% lower during the second study period than in 2007. The success rate decreased by 29.87%. The density of breeding pairs was 9.6 pairs/100 km^2 in 2007 and 4.8 pairs/100 km^2 in 2011. Significant changes in the study area were found in arable lands, orchards and vineyards as well as in several types of grasslands. A significant reduction of the areas of all categories of grasslands was observed. High positive correlation was observed between occupied territories and the area of quarries, grasslands, shrubs, grassland with single trees, and grassland with shrubs < 25%. Strong negative correlation existed between occupied territories and urban areas, arable lands and waters. The parameters of the breeding success were in a positive correlation with quarries, shrubs, forests, groups of trees, grasslands, grasslands with single trees, grassland with < 25% shrubs and Habitat diversity index (*H'*). A negative correlation existed between the breeding success and urban areas, arable lands, orchards and vineyards, waters and grassland with > 25% shrubs.

Keywords: population dynamics, Natura 2000, avian ecology, agricultural practices, Long-legged Buzzard

Introduction

Habitat change is ranked as the second most serious global threat to biodiversity (Walker, Steffen 1997, Nikolov 2010). Globally, grasslands cover about 3,500 millions of ha, an area twice larger than agricultural lands. In respect to ecosystem services, grasslands provide nutrients and shelter for domestic and wild animals. Most of the grasslands are priority sites for conservation. Extensively used pastures exist in harmony and balance with the wildlife (Carlier *et al.*2009). Most of the species related to grasslands are extremely vulnerable to the management practices of the land. For example, a sharp decline in the populations of many grassland birds affected by the intensification of the agriculture in Europe has been reported (Donald *et al.* 2001, 2006). Semi-natural pastures are still widespread in Bulgaria (Meshinev *et al.* 2005) but their area has substantially decreased. In the beginning of the 20th century, semi-natural pastures covered 18,000 km^2 (16% of the territory of Bulgaria) (Ganchev *et al.* 1964) but this area was significantly reduced and covers about 8,500 km^2 now (EEA 2010). The main reasons causing a decrease in this type of habitats are linked with the intensification of farming and turning grasslands into arable lands.

Unique sub-Mediterranean grasslands with high nature value and agricultural lands are represented at the Besaparski Ridove Special Protection Area (BG0000057) in Bulgaria (Tzonev *et al.* 2014). They represent about 90% of the territory of this Special Protection Area (SPA). Besaparski Ridove is of great concern to conservation of endangered species such as the Eastern Imperial eagle (*Aquila heliaca* Savigny, 1809). In addition, this is one of the most important places for nesting of Long-legged Buzzards (*Buteo rufinus* Cretzschmar, 1927) in Bulgaria and in the European Union (Kostadinova, Gramatikov 2007, Demerdzhiev 2014).

Open grasslands are important habitat for birds of prey because they use these places for feeding grounds. Birds of prey are indicator species for changes in ecosystems because they are very sensitive to alterations in the structure and fragmentation of the habitats (Palomino, Carrascal 2007). Since most of the birds of prey are top predators, their abundance and behaviour can be used in the monitoring of biotic effects on the contamination of environment, landscape changes and common level of biodiversity as well (Sergio *et al.* 2005). Large intensively used agricultural lands were abandoned after the collapse of the state-owned economy in Bulgaria. Large portions of these lands were gradually turned into semi-natural grasslands. A major percent of grasslands used as pastures were ploughed since Bulgaria became a member of the European Union and intensification in agricultural management was observed, especially in the lowlands in the country (Dobrev, Popgeorgiev 2014). An evidence of negative trends in birds populations in agricultural lands already exists (Spasov 2008). Getting a better understanding of the problem of the negative trends requires a significant study on the correlation between the structure and quality of the habitat and the abundance of birds (Suarez *et al.* 1997) and understanding of how birds select between differently managed habitats (Perlut *et al.* 2008). The response of the birds to changes in the habitat and its influence over behaviour and cycle of life of birds is widely studied (Wilcove 1985, Saunders *et al.* 1991, McGarigal, McComb 1995). Lately, more studies paid attention to the changes in open types of habitats like steppes with shrubs, grasslands and extensive agricultural lands (Herkert 1994, Bignal, McCracken 1996, Pain, Pienkowski 1997, Suarez *et al.* 1997, Sutter, Brigham 1998, Ormerod, Watkinson 2000, Wolff *et al*. 2001).

The Long-legged Buzzard belongs to the family Accipitridae. It is a medium-sized bird of prey (Forsman 1999). Its breeding range extends from southeastern Europe, northern Africa, and Asia Minor to north-western China (Snow, Perrins 1998). It reaches up to Hungary in the west (Hagemeijer, Blair 1997, Mebs, Schmidt 2006, Tibor, Tamas 2008).

The Long-legged Buzzard has an unfavourable conservation status in Europe (SPEC 3, Species of European Conservation Concern). At the national level, the species is of conservation priority (Biodiversity Act, Annex 2), protected over the whole territory (Biodiversity Act, Annex 3). However, in the end of the 20th century, the population of the Long-legged Buzzard has been stable across most of its range and it is now considered “least concern” (BirdLife International 2012). The few studies on the Long-legged Buzzard’s diet report that it feeds on small ground-dwelling mammals, mostly sousliks (*Spermophilus citellus*) but also on voles, lizards, snakes, birds and occasionally large insects (Ali, Ripley 1968, Varshavskiy 1973, Cramp, Simmons 1980, Michev *et al*. 1984, Vatev 1987, Alivizatos, Goutner 1997, Khaleghizadeh *et al*. 2005, Mebs, Schmidt 2006, Wu *et al*. 2008, Milchev 2009, Bakaloudis *et al*. 2012). The breeding population of Long-legged Buzzard in Bulgaria is estimated between 650 and 750 pairs and its trend is increasing (Demerdzhiev *et al*. 2007). Besaparski Ridove SPA harbours about 3% of the national population of the species. In Bulgaria, the species usually nests on cliffs, trees and, on rare occasions, on electricity pylons but also in quarries (Michev*et al*. 1984, Vatev 1987, Demerdzhiev *et al*. 2007, Milchev 2009). The species hunts in open habitats with predominantly grassy vegetation. Forsman (1999) recorded that the Long-legged Buzzard prefers steppe habitats.

The aim of the study is to examine the effect of land use changes between 2006–2011 (mainly the decrease of grasslands) on the distribution, density and reproductive parameters of the Long-legged Buzzards nesting in Besaparski Ridove SPA.

Methods

Study area

Besaparski Ridove SPA is located on the south-western part of the Thracian Plain (42°7’12”N, 24°23’11”E) (Fig. 1). The elevation is between 350 and 536 m a.s.l. These hills spread south- and eastwards to Stara Reka, westwards to the small river Pishmanka and northwards to Maritza River (Slaveykov, Zlatanova 2007). The SPA is characterized with plane to hilly relief. The climate is transitional-continental, with soft winters and hot summers. The area is characterized by the lack of

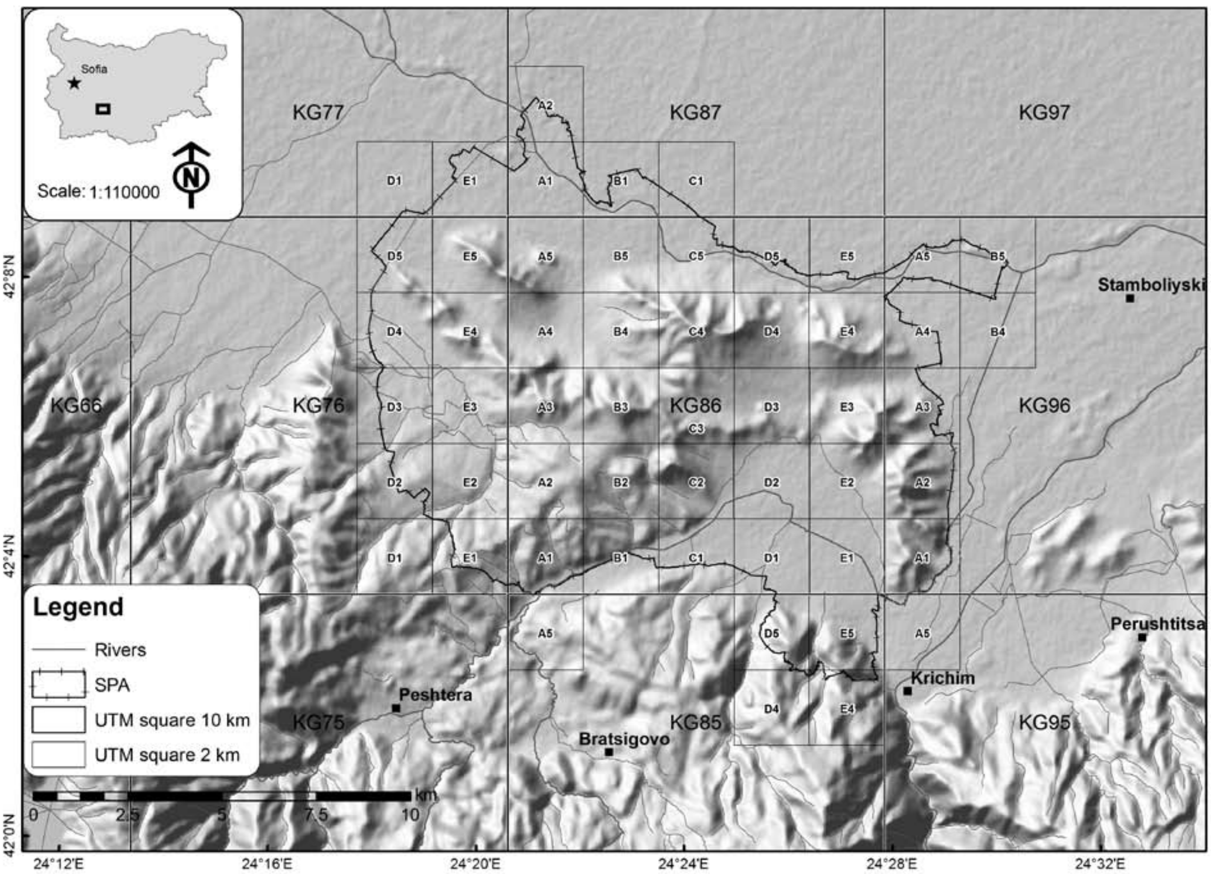

Fig. 1. Map of Besaparski Ridove Special Protection Area

water resources. Precipitation is between 500 and 800 mm/m^2. Soils are alluvial. Eroded and karstic hills, with almost no shrubs and trees but grass are very specific for the SPA. Forests cover under 6% of the territory (Dimitrov, Petrova 2014). The area of the SPA is about 152.9 km^2. The territory is covered mainly with calcareous and thermophilic grass societies (Tzonev *et al.* 2014) dominated by Bluestem (*Dichantium ischaemum* L.), Scented Grass (*Chrysopogon gryllus* L.) and Needle Grass (*Stipa capillata L.), imparting the steppe character of the habitat. There are fragments of broad-leaved forests of Downy Oak (Quercus pubescens* Willd.), Virgilian Oak (*Quercus virgiliana* Ten.), Broad-leaved Oak (*Quercus frainetto* Ten.), Common Oak (*Quercus daleschampii* Ten.) and Manna Ash (*Fraxinus ornus* L.). Small percentage of the territory is covered with shrubs such as the Christ's Thorn (*Paliurus spina-christi* L.), Cade Juniper (*Juniperus oxycedrus* L.) and Oriental Hornbeam (*Carpinus orientalis* L.). An endemic species occurs on the hills, i.e. Tekirska Mishorka (*Gypsophila tekirae* Stefanov, 1929).

Data collection

The study was carried out between 2006 and 2011. All nesting territories of the Long-legged Buzzard were mapped in 2007 and 2011 and were visited every 20–25 days between February–August. Nest site occupancy, incubation period, number of hatched and fledged chicks were described for each nest during this period. Each nest was marked with a hand-held GPS (Garmin, Olathe, Kansas, USA). Data from the nest territory visits were filled in a standard field protocol. All data were converted to ArcGIS from KML and GPX files. A model of the study area was developed based on orthophotos from 2006 (http://212.122.182.101/MRRB). The reference 2006 was chosen because it represents the period before Bulgaria became a member of the EU and related changes in the agricultural policy. All the changes in habitats mapped in the model refer to 2010.

Data analysis

ArcGIS 9.2 software (ESRI 2011) was used for developing a habitat model, which represents an analysis of habitat changes. In 2010, a mass destruction of the seminatural grasslands and grasslands was observed due to the subsidies applied to stimulate areas under cultivation. On the second step, all occupied territories, nest density and breeding success of the Long-legged Buzzards in 2007 and 2011 were added to the spatial model. Nesting parameters of the species were taken into consideration for the model a year after the changes in the land cover. We estimated the productivity (number of fledglings per occupied territory), the breeding success (number of fledglings per breeding pair) and the fledgling success (number of fledglings per successful pair). We also estimated the value of the success rate (frequency of breeding attempts with at least one fledged chick). The way the model was constructed was chosen because we expected that the conditions in the habitats during 2006 and 2010 will affect the species a year later. The changes in the habitats were verified by field visits of all polygons in 2010 in order to map all changes in comparison with 2006.The mapped changes were integrated in the overlay based on Corine Land Cover, referred to 2006.The study area was divided into plots with 2.2 km size of the sides. The distance of 2.2 km was the minimal hypothetic territory of the species in the SPA. We analysed each plot in respect to changes of habitat. Habitat selection of the species was analysed by comparing plots occupied by territories of the species with the same number of plots without territories of the species. The plots without any occupied territories were randomly selected and were respectively ten for 2007 and six for 2011. The area of the different habitats per each plot was calculated (Table 1).

Statistica for Windows, Release 7.0 (Statsoft inc. 2004) was used for the statistical analysis of the data. Non-parametric Mann-Whitney U–test was used to check the statistical reliability of the differences in different types of habitats in the habitat selection analysis. Chi-square statistics was used to analyse the changes in habitats during the two study periods. Principal component analysis (PCA) was applied to analyse indices which characterize territory occupancy and breeding success, and searching of correlation with types of habitats. Multivariate analyses were used in many studies to test habitat preferences in birds of prey (Janes 1985, Ceballos, Donazar 1989, Katzner *et al*. 2003). The significance level was set for all tests at $p < 0.05$.

PAST software (Hammer *et al.* 2001) was used to calculate the Shannon Diversity Index (Shannon 1949) for each study plot in 2006 and 2010.

Results

Demographic parameters of Long-legged Buzzard population during the study period

The distribution of the Long-legged Buzzard was mapped in the study area in 57 study plots in 2007 and 2011. During 2007, 14 occupied nesting territories were recorded in ten study plots. The maximal number of occupied nests was three per study plot. During the same year, the distribution of the species in the study plots was as follows: in one plot – three nests, two plots with two nests each, and seven plots with one nest each. During 2011, seven occupied nests were recorded in six study plots. The maximal number of occupied nests was two per study plot. The number of the hatched juveniles was 17 in 2007 and six in 2011, and the number of the fledged juveniles was 16 in 2007 and six in 2011. The maximal number of hatched and fledged juveniles per plot was five in 2007 and two in 2011. The demographic parameters of the Long-legged Buzzard population indicated higher values in 2007 (Table 2).

Comparing 2011 to 2007, the productivity decreased by 24.56%, the breeding success decreased

Table 1. Types of habitats used in the analysis

Variable	Description
Urban areas	area of infrastructure, roads and settlements (ha)
Quarries	area of quarries (ha)
Arable lands	area of arable land (ha)
Orchards and vineyards	area of orchards and vineyard (ha)
Shrubs	area of shrubs (ha)
Waters	area of river and water body (ha)
Forests	area of forest (ha)
Groups of trees	area of groups of trees (ha)
Grasslands	area of pastures and meadows (ha)
Grasslands with single trees	area of pastures and meadows with single trees (ha)
Grasslands with <25% shrubs	area of pastures and meadows with shrubs up to 25% (ha)
Grasslands with >25% shrubs	area of pastures and meadows with shrubs over 25% (ha)
Shannon *H'*	Shannon *H'* index of biodiversity of habitats

Table 2. Demographic parameters of the Long-legged Buzzard population during two study periods (2007, 2011) in Besaparski Ridove Special Protection Area. Mean values are reported ± SD

Breeding parameter	Year	
	2007	2011
Productivity (mean)	1.14±1.17	0.86±1.07
Breeding success (mean)	1.45±1.13	0.86±1.07
Fledgling success (mean)	2±0.76	2±0.00
Success rate % (mean)	72.73±46.71	42.86±53.45
Occupied territories	14	7
Incubating pairs	11	7
Number of fledglings	16	6

by 59.31%, and the success rate decreased by 29.87%. The pair density was 9.6 pairs/100 km^2 in 2007 and 4.8 pairs/100 km^2 in 2011.

Habitat selection of the Long-legged Buzzard

In 2007, the nesting habitats differed from random plots for two variables (Table 3). The first one was "Arable lands", where randomly selected plots had significantly larger area in comparison with the plots with occupied nests ($Z = 2.04$, $p < 0.05$). The second variable, "Grasslands", showed significant larger area for plots with occupied nests than for the randomly selected plots without occupied nests ($Z = 2.65$, $p < 0.01$). Nearly significant difference ($Z = 1.89$, $p = 0.06$) in favour of randomly selected plots

Table 3. Comparison of the habitats indicators in the study plots with occupied nests of Long-legged Buzzards versus the randomly selected plots in Besaparski Ridove Special Protection Area. Statistically significant difference set at p < 0.05, in bold

Variable	2007				2011			
	nests (ha)	random (ha)	Z	p	nests (ha)	random (ha)	Z	p
Urban areas	266.70	537.43	-0.76	0.45	137.85	398.76	-1.28	0.20
Quarries	167.49	55.72	1.44	0.15	109.28	6.91	1.20	0.23
Arable lands	558.25	1402.28	**-2.04**	**0.04**	455.99	1591.52	**-2.40**	**0.02**
Orchards & vineyards	146.86	89.34	0.72	0.47	118.91	36.72	0.96	0.34
Forests	72.93	284.28	-1.66	0.10	52.10	11.17	0.64	0.52
Shrubs	187.10	117.78	0.91	0.36	132.17	5.64	**2.16**	**0.03**
Water	5.85	143.97	-1.89	0.06	1.02	32.13	-1.20	0.23
Groups of trees	11.46	2.43	0.19	0.85	8.55	0.00	0.96	0.34
Grasslands	2795.68	1327.69	**2.65**	**0.008**	1426.50	669.80	1.60	0.11
Grasslands with single trees	233.97	205.62	-1.44	0.15	229.31	6.88	0.32	0.75
Grassland with < 25% shrubs	358.50	411.29	-0.53	0.60	221.70	139.50	-0.16	0.87
Grassland with > 25% shrubs	35.45	265.04	-0.49	0.62	10.62	5.35	-0.32	0.75

Table 4. A comparison between the areas of the different types of habitats during the study period. Statistically significant difference set at p < 0.05 in bold

Variable	Area in 2006 (ha)	Area in 2010 (ha)	χ^2	p
Urban_areas	3538.87	3537.52	0.26	0.99
Quarries	266.99	266.99	0.00	1.00
Arable lands	8236.45	10105.93	**190.54**	**0.0000001**
Orchards and vineyards	813.76	914.09	**5.83**	**0.02**
Forests	2463.28	2465.02	0.61	0.98
Shrubs	776.45	807.60	0.61	0.43
Waters	519.32	508.67	0.11	0.74
Groups of trees	52.68	58.02	0.26	0.61
Grasslands	7135.67	5363.53	**251.25**	**0.0000001**
Grasslands with single trees	1004.23	927.93	3.01	0.08
Grassland with < 25% shrubs	1810.39	1633.75	**9.06**	**0.003**
Grassland with > 25% shrubs	978.72	1007.75	0.42	0.51

was recorded for the variable "Water". In 2011, the habitats in the plots with occupied nests differed from randomly selected plots under the variables "Arable lands" and "Shrubs". Similarly to 2007, the area of "Arable lands" in the randomly selected plots was bigger than the plots with occupied nests ($Z = 2.4$, $p < 0.05$). "Shrubs" was the second variable in 2011 that showed significant difference between the plots with occupied nests and those without. The area of shrubs was larger in the plots with occupied nests ($Z = 2.16$, $p < 0.05$).

Habitat changes in the study area

Comparing the types of habitats during the study period, significant changes in the study area were found in "Arable lands", "Orchards and vineyards", "Grasslands" and "Grassland with shrubs up to 25%" (Table 4).

"Arable lands" in 2010 had grown by 22.7% (1,869.48 ha) in comparison to 2006. A significant growth of 12.33% (100.33 ha) was observed also in "Orchards and vineyards". A significant reduction of the areas of all categories of grasslands was observed (Table 4). "Grasslands" were reduced with 24.83% (1,772.14 ha) in 2010. "Grassland with shrubs < 25%" were reduced by 9.76% (176.64 ha). "Grasslands with single trees" were reduced by 7.6% (76.3 ha). Insignificant growth of the areas of "Grassland with shrubs > 25%" was observed (2.97%, 29.03 ha). However, changes in habitats were observed in the plots occupied by the Long-legged Buzzard in 2007 and afterwards abandoned in 2011. In 2011, five of all ten study plots occupied with nests in 2007 were abandoned. A significant growth of 90.32% (316.96 ha) of the "Arable lands" was observed in these plots and reduction of the "Grasslands" of 20.57% (318.42 ha) during the same time in the abandoned nesting territories.

Influence of habitat changes on the demographic parameters of Long-legged Buzzard population

The influence of the habitat changes during the study period on the occupied territories and the breeding success of the Long-legged Buzzard population was studied. The sum of the first three factors includes 62.06% of the variation in the habitats. Of all 13 variables tested, ten were bipolar and showed high correlations to one of the first three factors (Table 5, Fig. 2).

The first factor is defined by the different types of habitats. The second factor is connected to the biodiversity index of the habitats (Shannon *H'*).

High positive correlation was observed between occupied territories and quarries, grasslands, shrubs, grassland with single trees, and grassland with shrubs up to 25% (Table 6). Strong negative correlation existed between occupied territories and urban areas, arable lands and waters. The parameters of the breeding success (number of chicks and fledglings) were in a positive correlation with quarries, shrubs, forests, groups of trees, grasslands, grasslands with single trees, grassland with shrubs up to 25% and the Shanon Diversity Index (*H'*). A negative correlation existed between the breeding success and urban areas, arable lands, orchards and vineyards, waters and grassland with shrubs over 25%.

Table 5. Correlation coefficient between tested variables and the first three factors. Values over 0.55 are in bold

Variable	Factor 1	Factor 2	Factor 3
Urban areas	**0.80**	0.26	-0.09
Quarries	**-0.63**	0.13	0.51
Arable lands	**0.90**	-0.09	-0.18
Orchards & vineyards	0.17	0.08	**0.60**
Shrubs	**-0.70**	0.31	0.16
Waters	0.52	0.48	-0.11
Forests	**-0.59**	0.41	-0.38
Groups of trees	-0.36	0.33	-0.34
Grasslands	**-0.58**	-0.44	0.03
Grasslands with single trees	-0.43	0.40	**-0.62**
Grassland with < 25% shrubs	**-0.75**	-0.44	-0.14
Grassland with > 25% shrubs	-0.17	0.47	0.38
Shannon *H'*	-0.06	**0.91**	0.21

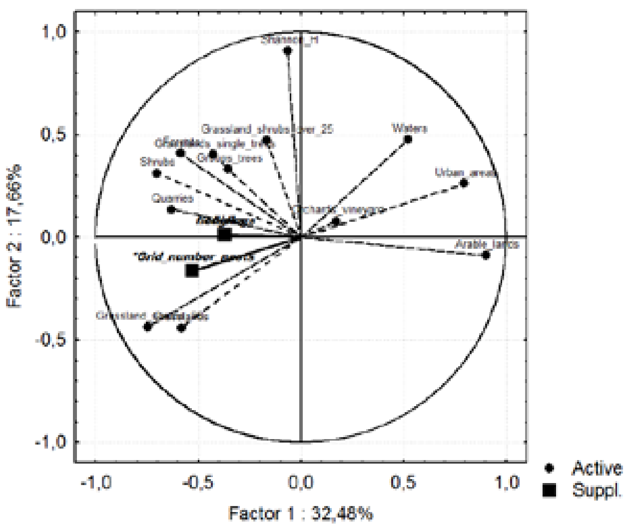

Fig. 2. Graphical representation of the habitats and studied demographic parameters toward the first two main axes

Discussion

Habitat changes affect populations of raptor species such as Golden Eagle (*Aquila chrysaetos*

Table 6. Level of correlation between the demographic parameters of the Long-legged Buzzard and the parameters of the habitats. The values over 0.3 are in bold

Variable	Occupied territories	Number of chicks	Number of fledglings
Urban areas	**-0.45**	-0.27	-0.25
Quarries	**0.42**	0.19	0.22
Arable lands	-0.52	-0.32	-0.32
Orchards & vineyards	-0.01	-0.11	-0.10
Shrubs	**0.35**	0.25	0.23
Waters	**-0.37**	-0.25	-0.26
Forests	0.05	0.18	0.18
Groups of trees	0.01	0.22	0.23
Grasslands	**0.46**	0.25	0.26
Grasslands with single trees	0.36	0.49	0.47
Grassland with < 25% shrubs	**0.38**	0.19	0.17
Grassland with > 25% shrubs	-0.13	-0.25	-0.25
Shannon *H'*	-0.04	0.06	0.07

Linnaeus, 1758) (Fielding *et al*. 2003, Sergio *et al*. 2006), Steppe Eagle (*Aquila nipalensis* Cabanis, 1854) (Sanchez-Zapata *et al*. 2003), Lesser Kestrel (*Falco naumanni* Fleischer, 1818) (Donazar *et al*. 1993, Tella *et al*. 1998, Sanchez-Zapata *et al*. 2003), Long-legged Buzzard (Friedemann *et al*. 2011), Common Buzzard (*Buteo buteo* Linnaeus, 1758) (Sergio *et al*. 2005, Palomino, Carrascal 2007), Hen Harrier (*Circus cyaneus* Linnaeus, 1766) (Amar, Redpath 2005), Montagu's Harrier (*Circus pygargus* Linnaeus, 1758) and Pallid Harrier (*Circus macrourus* Gmelin, 1770) (Sanchez-Zapata *et al*. 2003), Black Kite (*Milvus migrans* Boddaert, 1783) and Booted Eagle (*Aquila pennata* Gmelin, 1788) (Palomino, Carrascal 2007). Generally, habitat changes are negatively related with populations of raptors, even though sometimes a positive effect has been observed.

Habitat selection analysis shows that the Long-legged Buzzard in the study area avoids arable lands, urban areas and waters, preferring instead grasslands, including ones with trees, shrubs, and quarries. According to Vatev (1987), Long-legged Buzzards forage in areas covered with weeds and scattered bushes, which are constantly grazed by sheep and cattle. On Besaparski Ridove, the species hunts mostly in grasslands. The Long-legged Buzzard uses nest sites such as quarries, groups of trees, single trees often close to shrubby areas and electric pylons with high voltage. During a period of four years, the area of arable lands has considerably grown. Considering also the growth of the areas cultivated with orchards and vineyards, a significant growth of areas unsuitable for hunting has been observed. In general, the different types of grasslands have strongly decreased. Long-legged Buzzards, which hunt in these environments, suffer from a reduced prey base, and a strong decrease in the number of the occupied nests of Long-legged Buzzards has been observed in 2011 in comparison with 2007. The areas with occupied nests have also strongly decreased by 2011. The number of fledged juveniles is also clearly less during the second study period. A reduction of the values of all studied parameters of the Long-legged Buzzard is observed. A significant positive correlation exists between the different types of grasslands where the species hunts, and quarries and groups of trees used for nesting. The size of the open territories was in a significant positive correlation with the breeding success in Israel (Friedemann *et al*. 2011). The Long-legged Buzzards in Besaparski Ridove are usually hunting sousliks and pigeons (unpublished data). The transition to feeding with domestic pigeons represents a feeding adaptation of the species caused by the reduction of the souslik colonies. Such feeding adaptations are also observed for instance in the Imperial Eagle (Karyakin 1999, Katzner *et al*. 2005, Horvath *et al*. 2010, Demerdzhiev unpubl.). The significant reduction of the grasslands during the study period is also linked to the drastic decrease in the population of the European Souslik (*Spermophilus citellus*) in the same territory. In the used pastures, more than half of the habitats of the European Souslik have been destroyed (Nedyalkov, Koshev 2014). Thus, the Long-legged Buzzards are deprived of their main food resource and hunting grounds. Also, in the Eastern Rhodopes Mountains of northeastern Greece, a loss of open habitat and a strong decrease of souslik populations are reported as possible reasons for a long-term decline

(1979–2005) of Long-legged Buzzard populations (Poirazidis *et al*. 2010, 2011). Populations of raptors are limited by food resources and nest sites availability (Newton 1979). The population response of the Long-legged Buzzard to the drastic changes in land use on Besaparski Ridove is overall decrease. Territories where the changes are drastic and essential were abandoned and the nest density has decreased. Limited by its main feeding resource, the nesting pairs adapted to utilizing new resources or suffered from low breeding success.

These observations have broad implications for landscape planning and policy. Conflicts between species conservation and agriculture policies are known with regard to raptors and other birds (Tella *et al*. 1998, Nikolov *et al*. 2011). In southern Europe, cereal steppe habitat is a low-intensity system that is rapidly changing as a result of alterations in agricultural practices. Unimpeded and financially stimulated ploughing of grasslands and pastures and the destruction of the mosaic elements in them (groups of trees and shrubs), led in Natura 2000 sites to direct destruction of natural habitats, destruction and damages to feeding grounds for birds and breeding places for a large number of species of conservation priority. The state institutions such as The Ministry of Environment and Waters (MOEW) and The Ministry of Agriculture and Foods (MAF) do not have common criteria for defining types of use and habitats. That is why one plot of land may be considered simultaneously "arable land" according to MOEW and a "pastureland" by MAF. The lack of common criteria between state bodies is amongst the reasons for the drastic reduction of grasslands. The lack of adequate measures leads to striking cases when permanent grasslands, a habitat for many species, are ploughed and afterwards the same areas are used for granting subsidies under Measure 213 of the Rural Development Program: „Natura 2000 payments" or payments for farmlands linked with Directive 2000/06/EC. The lack of sanctions on behalf of MOEW and MAF resulting from „a lack of juristic justification" practically supports the habitat destruction.

The implementation of a common management system, based on the real state and use of the farming lands is needed (including control and finance floating of the activities). This will prevent the destruction of the grasslands and will stop the negative trends experienced by multiple species dependent on grasslands.

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