Breeding bird community in the Marangone river (mid-distal tract; Latium, Tyrrhenian central Italy): a first note on a poor-known site of high conservation concern

CORRADO BATTISTI
'Torre Flavia' Long Term Ecological Research (LTER) Station, Città metropolitana di Roma Capitale, Via G. Ribotta 41, 00144 Roma – E-mail: c.battisti@cittametropolitanaroma.it

Abstract

A preliminary survey on the breeding birds occurring along the mid-distal tract of the Marangone river (included in the 'Tolfetano-Cerite-Manziate' Special Protection Area; Latium, central Italy) has been carried out in spring 2022. Using the point/transect method, 36 species (32 breeding) have been recorded. Olive groves managed without undergrowth showed the higher values of number of species, normalized richness, mean abundance and Shannon-Wiener diversity, probably for the higher availability of ecotones: however, these preliminary data need to be confirmed. Further original quantitative studies and reviews should be carried out in this poor-known site of high ornithological value and conservation concern, neighbouring the Tolfa mountains.

Key words: Special Protection Area, Tolfa mountains, Olive groves, undergrowth management.

Riassunto

Comunità di uccelli nidificanti lungo il fiume Marangone (tratto medio-distale; Lazio, Italia centrale tirrenica): una prima nota su un sito poco noto, di grande interesse conservazionistico
È stata effettuata una ricognizione preliminare degli uccelli nidificanti presenti lungo il tratto medio-distale del fiume Marangone (compresa la Zona di Protezione Speciale "Tolfetano-Cerite-Manziate", Lazio, Italia centrale) nella primavera 2022. Utilizzando il metodo punto/transetto, sono state censite 36 specie (tra cui 32 nidificanti). Gli oliveti gestiti senza sottobosco hanno mostrato i valori più elevati di numero di specie, ricchezza normalizzata, abbondanza media e diversità di Shannon-Wiener, probabilmente per la maggiore disponibilità di ecotoni: questi dati preliminari necessitano tuttavia di conferma su dati più rappresentativi. Ulteriori studi originali, unitamente ad una revisione dei dati pregressi, dovrebbero essere effettuati in questo sito, a ridosso dei monti della Tolfa, di alto valore ornitologico e interesse conservazionistico, ancora poco indagato sotto il profilo quantitativo.

Parole chiave: Zona di Protezione Speciale, monti della Tolfa, Oliveti, gestione del sottobosco.

Introduction

The middle-distal stretch of the Marangone river (Municipalities of Civitavecchia and Santa Marinella; Tyrrhenian central Italy; coordinates: West border: 42°03'58.0"N 11°50'22.4"E; East border: 42°05'05.6"N; 11°51'12.7"E; Figs. 1 and 2) represents a site of high environmental value, included in the Special Protection Area 'Comprensorio Tolfetano-Cerite-Manziate' (92/43/CEE 'Habitat' Directive; code: IT 6030005). This area is currently impacted by several anthropogenic threats (in primis, urban sprawl).
Excluding general reviews at regional level (Brunelli *et al.,* 2011; Aradis *et al.,* 2013), there are no quantitative data on the local breeding bird communities. In this preliminary note, I want to contribute to a first arrangement in order to implement the data available aimed at protecting this mosaic landscape.

Study Area

The study area falls into the following vegetation types (Fanelli & Bianco, 2007; Di Pietro *et al.,* 2010): (i) forest and Mediterranean scrub areas belonging to the category of coastal and sub-coastal holm oaks and evergreen - coastal holm oaks [Viburno-Quercetum ilicis (Br.-Bl. 1936) Riv. Mart. 1975], with patches of sub-Mediterranean xeric shrubs with Quercus pubescens, belonging to Roso sempervirensis – Quercetum pubescentis Biondi 1986; (ii) landscape mosaics of Pyrus amygdaliformis and Echio-Galactition (Pruno—Rubion ulmifolii de Bolos 1954, Echio plantaginei-Galactition tomentosae O. Bolòs et Molinier 1969); (iii) hilly grasslands (Vulpio-Dasypyretum Fanelli 1988); (iv) xeric pastures with *Cynara cardunculus* e *Asphodelus microcarpus*. Locally, olive groves are actively managed by the Università Agraria di Civitavecchia, the Agency having competence regarding the Commons, which periodically manage the undergrowth, removing shrubs under the olive trees.

Methods

In spring 2022 (16 April), I carried out a stratified sampling design locating 19 standard points/transects, each one 10-mi-

Fig. 1. Marangone valley (mid-distal tract; image obtained form Monte Paradiso – Civitavecchia; Photo: C. Battisti, April 2022).

Fig. 2. The map of the study area (Marangone river - mid-distal tract). Top-left the town of Civitavecchia (Rome, central Italy). Source: Google Maps.

nutes long (Bibby *et al.,* 2000), placed in representative way along the mid-distal sector of the Marangone river (toponyms: Fosso del Marangone, Macchia del Semaforo, Puntone della Molaccia e Buche della Madonnina, Monte Paradiso; range: approximately 30-300 m a.l.m.; Technical Regional Map CTR Lazio 363100, 363110), obtaining replicated sessions divided into three habitat types (olive groves with Mediterranean scrub undergrowth: OM; olive groves without undergrowth: OS; wooded pastures and mosaics: PA). I obtained data only on presence and abundance of single individuals, without any assignement on their sex and age. After, the data were processed by obtaining the relative frequency of each species (fr = n. of individual contacts of i-th species/n total contacts) and some indices at the community level (absolute number of species, S; mean abundance ind./point-transect, Abb m; Margalef normalized richness, Dm; Shannon-Wiener diversity index, H'; evenness, e; for a review of indices: Magurran, 2004). For taxonomy and systematic I refer to Baccetti *et al.* (2021).

	Olive groves with undergrowth (OM)	**Olive groves without undergrowth (OS)**	**Pastures**			
Species	N	Fr	n	Fr	N	Fr
Milvus migrans					VA	
Milvus milvus	VA				VA	
Buteo buteo	1	0.011	1	0.005		
Larus michahellis						
Columba livia domestic form	7	0.078	8	0.043		
Columba palumbus	2	0.022	6	0.032		
Streptopelia decaocto			1	0.005		
Streptopelia turtur			1	0.005		
Cuculus canorus			1	0.005	1	0.071
Apus apus					VA	
Upupa epops	1	0.011	5	0.027		
Jynx torquilla			1	0.005		
Picus viridis	5	0.056	3	0.016		
Dendrocopos major	1	0.011	2	0.011		
Galerida cristata					2	0.143
Lullula arborea					1	0.071
Erithacus rubecula	2	0.022	1	0.005		
Luscinia megarhynchos	6	0.067	5	0.027		
Turdus merula	4	0.044	12	0.065		
Sylvia atricapilla	6	0.067	22	0.118		
Sylvia communis			2	0.011		
Sylvia melanocephala	8	0.089	16	0.086	4	0.286
Cyanistes caeruleus	16	0.178	35	0.188	2	0.143
Parus major	8	0.089	23	0.124	2	0.143
Certhia brachydactyla			1	0.005		
Garrulus glandarius	15	0.167	16	0.086	1	0.071
Pica pica	3	0.033	2	0.011	1	0.071
Corvus cornix	3	0.033	11	0.059		
Sturnus vulgaris			4	0.022		
Passer italiae	1	0.011				
Fringilla coelebs	1	0.011	6	0.032		
Emberiza cirlus			1	0.005		
N		90		186		14

Tab. 1. Bird species recorded (n: number of individuals; Fr: relative frequency) in the three habitat types. In bold, the species of European conservation concern. HF: observed in high flight. N: total numbers of individuals.

The Mann-Whitney U test for equal medians was used to pairwise compare the median values. All analyses have been performed using the Past software (Hammer *et al.,* 2001). Alpha level was set at 0.05.

Results

Totally, 311 individuals (36 bird species) have been recorded. Among them, 290 belong to 32 local breeding species (Tab. 1). Bubulcus ibis, Phylloscopus sibilatrix, P. bonelli, Ficedula hypoleuca resulted in migratory pass or used the area as trophic vagrants.

Olive groves managed (without undergrowth) showed higher values of number of species, normalized richness, average abundance and Shannon-Wiener diversity (Table 2). In particular, the average number of both species and individual contacts (Abb m) was higher in olive groves without undergrowth when compared to olive groves with undergrowth, even if the differences were not significant (mean number of contacts: Z = 0.92, p = 0.36; mean number of species: Z = 0.88, p = 0.37; Mann-Whitney U test; Fig. 2): this can be explained by the greater availability of ecotones and heterogeneity at the landscape scale in olive groves without undergrowth (with a higher diversification of niches and resources), even if these first data need to be confirmed on a larger and more representative sample.

	OM	OS	PA
S	18	25	8
Abb m	15 (5.48)	18.33 (5.82)	10,5 (4.12)
Dm	3.778	4.593	2.652
H'	2.541	2.663	1.946
E	0.879	0.827	0.936

Tab. 2. Parameters of the breeding bird communities in the three habitat types. S: number of species; Abb m: mean abundance (n. ind. Point/transect); Dm: normalized species richness (Margalef index); H': Shannon-Wiener diversity index; E: evenness index. OM (Olive groves with undergrowth), OS (Olive groves managed without undergrowth), PA (Pastures).

Apart Milvus migrans, M. milvus and Lullula arborea, species of European conservation concern (i.e., included in EU 147/2009 'Bird' Directive), yet recorded in this area (Brunelli *et al.,* 2011; Aradis *et al.,* 2012; Guerrieri *et al.,* 2013; Minganti *et al.,* 2013), it will be necessary to confirm or, in the case of previous confirmed presence, to quantify the densities of other species of ecological-conservation interest already reported, also for the neighboring areas: Circaetus gallicus (Ceccarelli & Ricci, 2007; F. Cauli, pers. comm.), Accipiter nisus, Falco peregrinus, Tyto alba (Guerrieri & Castaldi, 2004), Burhinus burhinus (Biondi & Pietrelli, 2015), Caprimulgus europaeus, Coracias garrulus, Melanocorypha calandra, Calandrella brachydactyla, Anthus campestris, Sylvia undata, Lanius collurio, L. minor, Emberiza hortulana, Buteo buteo, Falco subbuteo (see also Brunelli *et al.,* 2011; Aradis *et al.,* 2012; Bernoni *et al.,* 2012).

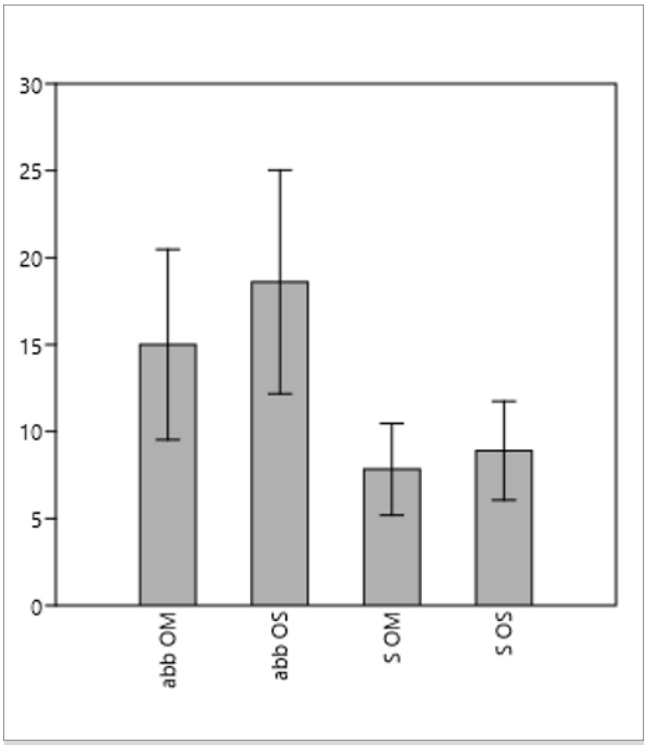

Fig. 3. Mean abundances (abb) and mean species number (S; y-axis) in olive groves with undergrowth (OM) and without undergrowth (OS).

Conclusions

Although preliminary, this note is meant to emphasize the ornithological value of this poor-known area (peripheral to the central core of the Tolfa Mountains), which is still little quantitatively studied. Further specific studies and a review of occasional unpublished data (e.g., reported on iNaturalist, Ornitho.it) are necessary, in order to increase knowledge and to contrast a set of local anthropogenic threats (land consumption, sprawl urbanization, fires, forest cuts, stone clearing, generic disturbances from uncontrolled use such as, for example, off-road vehicles). An agreement between the environmental associations that frequent this site (e.g., LIPU-BirdLife Italy), the Municipal administrations (Civitavecchia and Santa Marinella Municipality) and the local Common Agency that manages the olive groves and carry out the grazing activities (Università Agraria of Civitavecchia) could be strategic to counter these threats, also through specific actions: operational interventions, abuse control, conservation education (see Jacobson *et al.,* 2015); communication improving awareness and so on (see LIFE10/NAT/IT 00247. 'Val. Ma. Co.'; https://www.youtube.com/watch?v=QLV3nWrlKeU).

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